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LIFE CYCLE COST GUIDE FOR EQUIPMENT ANALYSIS.(U)
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MANAGEMENT ENGINEERING DEPARTMENT

LEVEL II

NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY
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(6) LIFE CYCLE COST GUIDE FOR EQUIPMENT ANALYSIS.

PREPARED FOR

NAVAL MATERIAL COMMAND

BY

THE NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY

MANAGEMENT ENGINEERING DEPARTMENT

COST MANAGEMENT DIVISION

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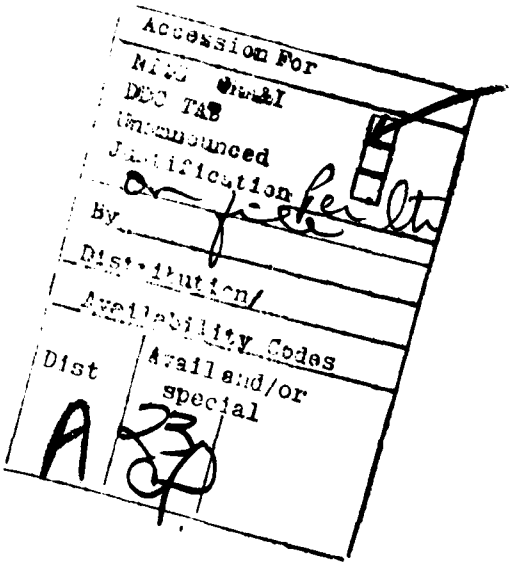
ABSTRACT

The Life Cycle Cost Guide for Equipment Analysis updates and supercedes the Life Cycle Cost Guide for Government Furnished Equipment and its associated Customer Support Package. This document differs extensively from the previous guide in cost model structure, in equation and cost factor description, and in computer program structure. The major changes are:

- The total Life Cycle Cost was divided into three major cost elements: Research & Development, Investment, and Operation & Support;
- The entire Cost Breakdown structure was revised, new cost elements were added, and new equations and cost factors were introduced. Program Management and Termination Costs have also been included;
- Four types of yearly inflation rates (Research and Development Procurement, Military Construction, and Operation and Maintenance) and yearly discount rates were included to calculate costs in terms of inflated or inflated & discounted dollars;
- A new computer program has been developed for this Guide. This program maintains the previous report structure; however, new reports are provided: Equations, Cost Adjustment factors, Funding by Cost Category, Cost Breakdown by Year, and Annual Cost by Funding Type. These reports are available in constant dollars, inflated dollars, or inflated & discounted dollars. The reports can be selectively requested.
- The new computer program enables the analyst to modify the standard Life Cycle Cost Model to his specific project needs without making any program changes. The format of the reports is automatically adjusted for all changes.



MANAGEMENT SUMMARY

The Life Cycle Cost Guide for Equipment Analysis is a standardized and automated Life Cycle Cost Methodology provided by the Naval Material Command to be used in the Life Cycle Cost Analysis of equipments procured for the Navy.

The total Life Cycle Cost is divided into three major cost elements: Research & Development, Investment, and Operating & Support Costs. These cost elements are divided into 85 sub-cost elements, 61 of which comprise the basic equations. The basic equations are further defined by 104 cost factors.

Each equation is identified as belonging to a cost category, i.e., Contractor Payment, Program Management, Testing, Prime Equipment, Training, Supply Support, Technical Data, Support Equipment, Operation, or Maintenance, and a funding type i.e., Research & Development, Procurement, Construction, Operation & Maintenance, Military Personnel, or Others. The costs can be adjusted to reflect the time value of money.

The program provides 13 reports at different depths of detail and with various types of information. These reports are grouped into two basic categories:

A. Input Data Reports present the input data and the information built in the program in five formats to provide the basic information about the cost model, the cost factor description, values, and general remarks about the project.

These reports are:

1. Equations
2. Remarks
3. Dictionary
4. Variable Values
5. Cost Adjustment Factors

B. Output Reports present the calculated values of the Life Cycle Cost in eight formats. These reports are:

1. Summary
2. Funding by Cost Category
3. Cost Breakdown by Year
4. Cost Breakdown Totals
5. General Funding
6. Annual cost by Funding Type
7. Annual Cost by Cost Category
8. Sensitivity Analysis

The computer program developed for the Life Cycle Cost Equipment Model is designed to provide the analyst the flexibility to modify the standard Life Cycle Cost model to his specific project needs. The procedures are user-oriented and do not require any computer program changes. Using this technique, the analyst can redefine the entire cost structure.

This special programming technique provides the user a program readily available to be adopted to various types of cost models. This technique has been successfully demonstrated in many on-going projects and was also used for the development of the Major Weapon System Life Cycle Cost Model.

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LIFE CYCLE COST GUIDE FOR EQUIPMENT ANALYSIS

I. SCOPE

The purpose of this guide is to provide a basic understanding of the methodology used in the LCC (Life Cycle Cost) analysis of equipment procured for the Navy. Figure I.1 provides an overview of the LCC analysis approach for Naval Material Command procurements. Sections II & III and associated Appendices describe the Naval Material Command Equipment LCC methodology and the procedures for data collection. Sections IV, V & VI and associated Appendices describe the ADP (Automatic Data Processing) model available for use in calculating Life Cycle Cost.

By standardizing and automating the costing methodology, the Naval Material Command has provided the System Commands with an effective tool for using Life Cycle Costing in their procurement decisions.

II. LIFE CYCLE COST METHODOLOGY

Life cycle cost is defined as the total cost to the Government of acquisition and ownership of an equipment over its full life. It includes the cost of development, investment, and operating & support.

This section establishes a standardized life cycle cost estimating model for identifying and assembling cost elements and cost categories for Equipments.

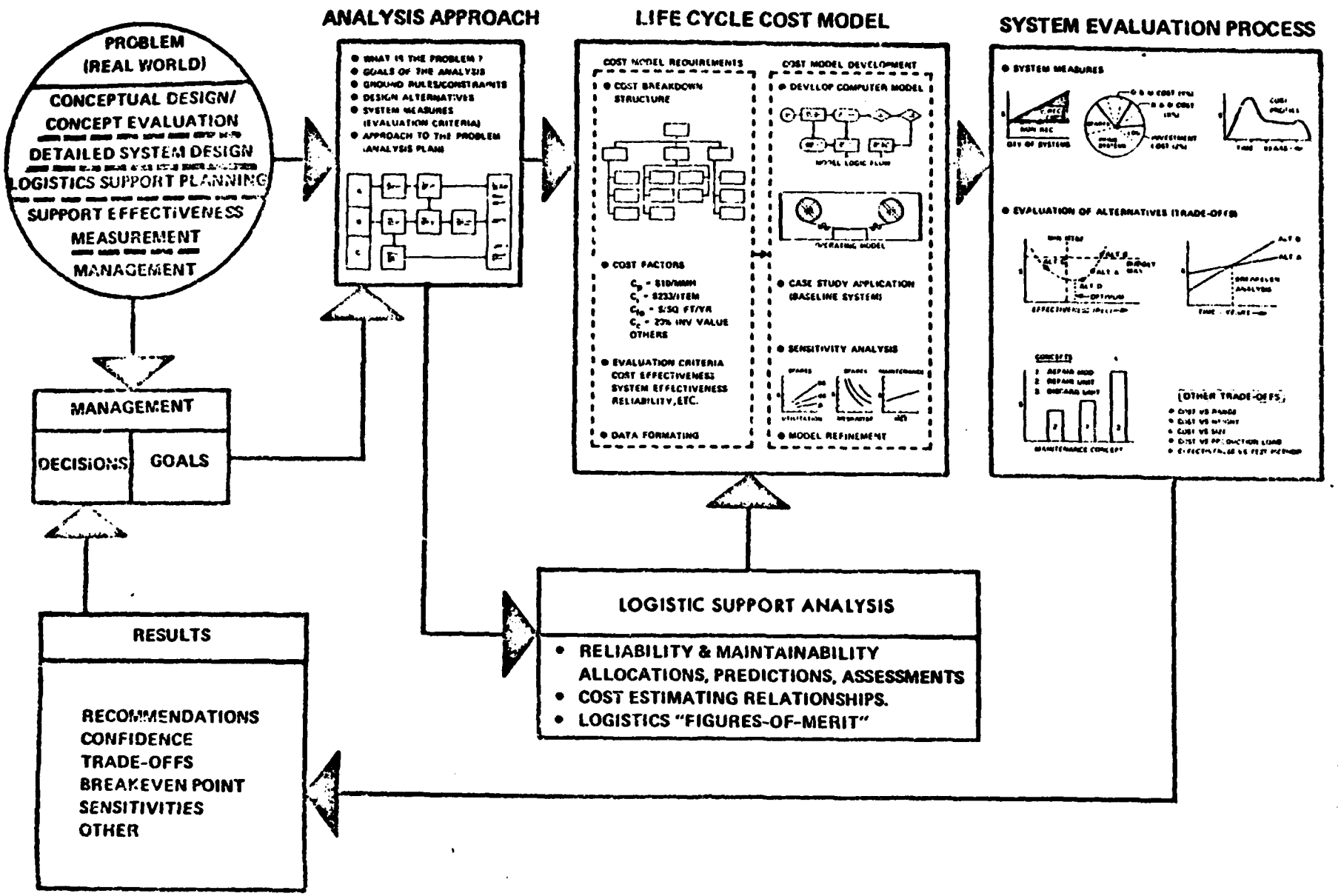

FIGURE 1-1. LIFE CYCLE COST ANALYSIS APPROACH

The life cycle cost breakdown structure provides a framework for collecting, analyzing, estimating, synthesizing, computerizing, and reporting life cycle costs. It provides a check list to assure that all pertinent costs are included in the analysis without duplication. It also provides the basic structure for keeping track of the various costs and aggregating them into summary cost elements. Each of the costs are identified by year and then adjusted as required in accordance with the time value of money theory as described in Appendix C (Inflation/Discounting Adjustment Factors).

The total life cycle cost is divided into three major cost elements: Research & Development, Investment, and Operating & Support costs. These cost elements are then divided into 85 sub-cost elements, 61 of which comprise the basic equations which quantify the major cost elements. The calculation of these costs and their summation into a total life cycle cost form the basis of the LCC Methodology. The standard cost equations in the LCC model uses 104 major cost factors. These factors are the bits and pieces of information which are usually generated during the process of equipment procurement, acquisition, and ownership.

The Life Cycle Cost Breakdown Structure and Equation Directory which identifies cost category, funding type,

and the inflation factor type assigned to each basic equation is provided in table II.1

Appendix A provides the basic cost equations and cost factor descriptions.

Appendix B provides an alphabetical listing of the 104 Life Cycle Cost factor names, descriptions, dimensions, and the likely source of information used in the cost equations.

Every cost equation identified in the Equipment Life Cycle Cost model is assigned to one of ten major cost categories. For reference purposes, each is assigned a numerical code. These Cost Categories and their assigned code numbers in the Equation Directory are:

Contractor Payment	1
Program Management	2
Testing	3
Prime Equipment	4
Training	5
Supply Support	6
Technical Data	7
Support Equipment	8
Operation	9
Maintenance	10

Every cost equation is assigned to one of six funding types. These funding types and their code numbers in the Equation Directory are:

Research & Development	1
Procurement	2
Construction	3
Operation & Maintenance	4
Military Personnel	5
Others	6

LIFE CYCLE
COST BREAKDOWN STRUCTURE AND
EQUATION DIRECTORY

CBS NO		Cost Cat.	Fund Type	Infl. Type
000000	TOTAL LIFE CYCLE			
100000	RESEARCH AND DEVELOPMENT			
110000	Validation			
111000	Contractor	1	1	1
112000	Government	2	1	1
120000	Full Scale Development			
121000	Contractor			
121100	Management	1	1	1
121200	Engineering	1	1	1
121300	Prototype Hardware	1	1	1
121400	Software	1	1	1
121500	Test & Evaluation	1	1	1
121600	Documentation	1	1	1
121700	Support & Test Equipment	1	1	1
122000	Government			
122100	Program Management	2	1	1
122200	Prototype Test & Evaluation			
122210	Training	5	5	4
122220	Test Site Activation	3	3	3
122230	Test & Evaluation	3	1	1
200000	INVESTMENT			
210000	Government Program Management	2	2	1
220000	Prime Equipment Acquisition			
221000	Production Hardware	4	2	2
222000	Production Support & Services	4	2	2
223000	Production Test & Evaluation	3	2	2
224000	Transportation	4	2	2
225000	Installation and Checkout	4	2	2
230000	Initial Support Acquisition			
231000	Support & Test Equipment Acquisition	8	2	2
232000	Supply Support			
232100	Initial Spares			
232110	Prime Equipment	6	2	2
232120	Support & Test Equipment	6	2	2
232200	NSN Entry into the Supply System	6	4	4
233000	Facilities			
233100	Operational	9	3	3
233200	Maintenance	10	3	3
234000	Documentation			
234100	Acquisition	7	2	2
234200	Reproduction and Distribution	7	2	2
235000	Training			
235100	Operator	5	5	4
235200	O/I level Maintenance	5	5	4
235300	Depot level Maintenance	5	4	4
235400	Instructor	5	5	4
235500	Training Aids	5	2	2

Table II.1

LIFE CYCLE
COST BREAKDOWN STRUCTURE AND
EQUATION DIRECTORY

CBS NO		Cost Cat.	Fund Type	Infl Type
300000	OPERATING AND SUPPORT			
310000	Operation			
311000	Personnel	9	5	4
312000	Facilities	9	3	3
313000	Energy Consumption	9	4	4
314000	Material Consumption	9	4	4
315000	Software Maintenance	9	4	4
320000	Support			
321000	Corrective Maintenance			
321100	Labor			
321110	O/I level (Remove & Replace)	10	5	4
321120	O/I level (Repair)	10	5	4
321130	Depot level (Repair)	10	4	4
321200	Repair Material	10	4	4
321300	Transportation and Packaging			
321310	Material Handling Labor	10	4	4
321320	Packaging Material	10	4	4
321330	Shipping	10	4	4
322000	Preventive Maintenance			
322100	Labor	10	5	4
322200	Material	10	4	4
323000	Overhaul			
323100	Labor	10	4	4
323200	Material	10	4	4
323300	Transportation	10	4	4
324000	Support & Test Equipment Maintenance	10	4	4
325000	Facilities			
325100	Shop Space			
325110	O/I level	10	3	3
325120	Depot level	10	3	3
325200	Inventory Storage			
325210	O/I level	10	3	3
325220	Depot level	10	3	3
326000	Documentation Maintenance	7	4	4
327000	Supply Support			
327100	Replenishment Spares	6	4	4
327200	Supply System Management	6	4	4
328000	Training			
328100	Operator	5	5	4
328200	O/I Level Maintenance	5	5	4
328300	Depot Level Maintenance	5	4	4
330000	Termination	6	4	4

Table II.1 (Continued)

Each cost equation in the Equipment Life Cycle Cost model can be adjusted for the time value of money by one of four types of inflation factors and one discount factor. These inflation factors and their code numbers in the Equation Directory are:

R & D	1
Procurement	2
Construction	3
O & M	4

Operation & Maintenance and Military Personnel are assumed to use the same O&M type of inflation factor. Funding type "Others" could use any one of the inflation factors.

III. DATA COLLECTION

Life Cycle Cost analysis requires the collection and processing of 104 cost factors. The principle data sources are the System Project Office, the Contractor, and the Logistic Support organization. The Project Management Office will provide data concerning the system operations, acquisition costs, project schedules and various contractual related information. Information pertaining to the inherent design characteristics of the system will be available from the contractor. The ILS Manager and his Logistic Element Managers will have access to data on maintenance, personnel & training, technical data, transportation, etc., during the ownership period. The analyst will be required to provide all other cost factors by converting some of the raw data collected during the interviews into applicable information.

It is recommended that the cost equations' description presented in section II be used as a guide during the interviews.

The basic steps in the data collection and processing are the same whether life cycle costs are calculated manually or by using the ADP program. The ADP method simplifies the calculation requirements, but it also requires an analyst to become familiar with translating LCC factors into a format acceptable to a computer.

Sections IV & V will provide information on how to use the ADP technique for the NAVMAT LCC model. Section VI will present the FLEX technique on how to modify the standard NAVMAT Equipment LCC Model.

IV. AUTOMATIC DATA PROCESSING

Although an analyst can use the model without knowing all the details of the calculations, a general knowledge of the logical content contained in the model is useful in properly developing input data, in properly interpreting results and in appreciating the capabilities and limitations of the model.

The LCC model consists of three functional processes:

A. ADP Model Input Logic

Like any computer model, a problem to be analyzed by the LCC model must be presented in the form of input data

of particular types. Once the analyst has prepared data on the input forms, the data is converted to punched cards. Each type of data card is read in and the data is converted to a form needed for subsequent operations. The model routines that process input data also apply various logical tests to verify that the data is correct and complete within certain limits. If these tests or edit checks uncover discrepancies in the data, error messages are produced. For some errors operation of the model will stop, while for others processing will continue. The input routines also provide reports of the input data which are returned to the analyst along with results of the output reports. These input reports can be used to check that the data has been properly entered. They also serve as ready reference for interpreting the results of the model. Once all input data is read in and established in arrays, the logical process of the model automatically begins. All of the processing is done internally and does not require the attention or intervention of the analyst.

B. Cost Calculations

In calculating Life Cycle Cost, the model considers the hierarchal structure of the cost elements that have been defined in section II. The cost of a cost element is the sum of the indentured cost elements below it. For example: total life cycle cost is calculated as the sum of the Research

& Development, Investment, and Operating & Support costs. This feature requires that only those cost elements that do not have lower indentured cost elements need be described by equations. The model calculates the cost of each equation by year. These costs are then adjusted as required by the time value of money theory.

Every cost element described by an equation also has identified with it a life cycle phase, cost category, funding type, and adjustment factor.

C. Reports

The purpose of a life cycle methodology is to take the diverse bits of information describing a specific bid or set of circumstances and produce a unique value called the total life cycle cost. The comparison of the LCC values provides the System Project Manager with an important decision-making factor. The ADP program provides various reports at different depth of detail and types of information that are grouped into two basic categories:

1. Input Data Reports

These are the reports that present the input data and the built-in information in various formats to provide the basic information about the cost model, the cost parameter description and values, and the general remarks about the project. These reports are:

(a) Equations

This is the listing of the cost breakdown structure and associated equations (in reversed Polish notation). Identified with cost breakdown structure number, cost element description, and cost equations.

(b) Remarks

This is the listing of the remarks included for explanatory purposes.

(c) Dictionary

This is the alphabetical listing of the input parameter names, definitions and associated units of the cost factors.

(d) Variable values

This is the alphabetical listing of the names, definitions, units, and values of the cost factors.

(e) Cost adjustment factors

This is the listing of the annual inflated, inflated and discounted, and discounted cost adjustment factors.

2. Output Reports

These are the reports that present the calculated values of the life cycle cost in various formats. There are eight computer generated reports:

(a) The SUMMARY report presents the total life cycle cost cross-referenced by the major cost categories and the cost elements.

(b) The FUNDING VS. COST CATEGORY report presents the total life cycle cost cross-referenced by the major cost categories and funding types.

(c) The COST BREAKDOWN BY YEAR report presents the yearly breakdown of the basic cost elements.

(d) The COST BREAKDOWN TOTALS report presents the total life cycle cost of each basic cost element. The cost of each basic cost element is also expressed as a percentage of total LCC.

(e) The GENERAL FUNDING report presents the total life cycle cost cross-referenced by funding types.

(f) The ANNUAL COST BY FUNDING TYPE report presents the total life cycle cost by year by funding type.

(g) The ANNUAL COST BY COST CATEGORY report presents the total life cycle cost by year by cost category.

(h) The SENSITIVITY ANALYSIS report summarizes the effect of varying a single cost factor's value on the total life cycle cost.

V. NAVMAT EQUIPMENT LCC MODEL INPUT FORMATS

The operation of the Equipment Life Cycle Cost model requires that a variety of input data be prepared by the analyst to describe the equipment being analyzed. A Run

Deck sequence of the computer cards is shown in figure V.1. A NAVMAT Equipment LCC model sample computer run is provided in Appendix D. There are five types of input formats required from the analyst. These are:

A. Analysis Identification

This form identifies the analysis and prints the title on the cover page and on the succeeding report pages. The maximum number of characters for the analysis identification is 100. The identification is to be contained in columns 1 through 80 of the first card and columns 1 through 20 of the second card (if required). All characters will appear as the analysis identification on each report page; if no information is given then "No analysis identification was provided" will be printed.

B. Control Options Card (CN card)

The control options card (CN card) has several switches to suppress printing of reports.

Input Data Reports are selectively printed or not printed in accordance with the following code:

0 or blank = No report printed
1 = Report printed

Output Reports are selectively printed or not printed in accordance with the following code:

0 or blank = No report printed
1 = Report printed in constant dollars
2 = Report printed in inflated dollars
4 = Report printed in inflated and discounted dollars

LCCFLEX RUN DECK SEQUENCE

```
//NWQPxxxx JOB (13440dii,C,U,N),'LCC-Analyst's name)
// EXEC LCCFLEX,RUN=1,LINES=5000
//IDENT DD *

: Identification cards go in here                          :

//CS DD *

: CS and EQ cards go in here                               :
: Referred to as CS FILE and used only for FLEX  option    :

//NV DD *

: NV and DS cards go in here                               :
: Referred to as NV FILE and used only for FLEX  option    :

//DATA DD *

: CN card                                                  :
:                                                          :
: RM cards                                                 :
:                                                          :
:  &INPUT                                                  :
:                                                          :
:  NAMELIST input data cards go in here                    :
:                                                          :
:  &END                                                    :
:                                                          :
: SA Sensitivity analysis cards go in here                 :

//
//
```

xxxx Project identification
d department code
ii Analyst's initials

Figure V.1

If more than one type of printout is desired, simply add the integer of the individual reports and enter the resultant number. For example, the number 3 (1+2) will produce two reports, one in constant dollars and the other in inflated dollars. An entry of 7 (1+2+4) will produce three reports, one in constant dollars, one in inflated dollars, and one in inflated and discounted dollars.

The last switch on the form provides the user with an option of entering the adjustment factor for inflation in the form of either the inflation rate or the inflation factor. The switch is controlled as follows:

0 or blank = Inflation rates
1 = Inflation factors

If there is no CN card all of the reports will be printed.

The format of the CN card is as follows:

Column(s)	Description
1-2	Card type "CN"
3	Equation
4	Remarks
5	Dictionary
6	Built-in variable values
7	User input variable values (Used only for LCCFLEX)
8	Cost adjustment factors
9	Summary
10	Funding by cost category
11	Cost breakdown by year
12	Cost breakdown totals
13	General funding
14	Annual cost by funding
15	Annual cost by cost categories
16	Sensitivity analysis
17-19	Not used

20	Inflation rate/factor input option
21-80	Not used

C. Remark Cards (RM cards)

The remark cards allow the user to describe or provide additional information for explanatory purposes. The remarks entered in this format are printed on a seperate output page. If no remark card is used, "No remarks" is printed. Each remark card should be coded with the characters RM on the first and the second column of the card. The user can include as many RM cards as needed.

D. & Input Card (for NAMELIST input)

The basic input data is entered on NAMELIST input cards. NAMELIST is a special input processing technique that allows a great deal of freedom and brevity in providing input data to a program.

Certain rules govern the use of the NAMELIST technique; these rules are described here. The first card for NAMELIST input must have "&" in column 2 followed by a NAMELIST name (for this program that name is input) and the name followed by a blank. Subsequent cards do not use this identification but column 1 must be blank. The end of NAMELIST data is signified by entering "&END" after the final model input data. Data is entered in the format "Variable name = Variable value." If the variable is defined as an integer (in this program only dimensioned

scalars are integers), the value must be an integer (not contain a decimal point). Embedded blanks in the name or value are illegal, but blanks may appear before or after each (CAUTION: Blanks after a value with no decimal point will be interpreted as zeros). A comma must be used to delimit and separate data entries. Input to arrays may be done in one of several ways. Some of these ways are illustrated in the following example.

Assume an array "A" dimensioned by three, into which it is desired to enter the value 8, 8, 5. This can be done, under NAMELIST input by:

```
A(1) = 8., A(2) = 8., A(3) = 5.,

OR

A = 8.,8.,5.,

OR

A = 2*8.,5.,

OR

A(1)=8., A(3)=5.,
```

In the last form, the program will take the first value as default for the second.

The Government Furnished Equipment Life Cycle Cost model contains 104 cost factors which are written in the NAMELIST format. There are three types of cost factors:

1. Scalars

These are the single value cost factors. There are 43 scalars in the LCC Equipment model. All scalars have

a range varying from 0 to 10^9 except scalars "BY" and "IYI", which are restricted to vary from 1 to 30, and scalar 'TERM' which varies from -10^9 to 10^9. Scalar names are listed in alphabetical order as follows:

BY	CE	CIPE	CM	CP	CSD	CSI
CSO	CTI	CTM	CTO	CTP	CTPE	CU
FDRT	FILS	FIRT	FM	FPST	IYI	NP
NSNP	NSNS	OHL	OHM	OHT	OT	PO
PSOS	RAM	RAP	RDM	RIE	RIM	RO
RPL	RPM	RSD	RSL	RSR	STEM	STES
TERM						

2. Dimensioning Scalars

These are the single value cost factors governing the dimensions of the arrays. There are three dimensioning scalars in the NAVMAT Equipment LCC Model. Dimensioning scalars and their respective minimum and maximum range values are listed as follows:

Name	Min. range	Max. range
NK	1	500
NM	1	10
Y	1	30

3. Arrays

These are the subscripted multiple entry cost factors. Dimensions of these arrays are controlled by dimensioning scalars. All arrays have a range varying from 0 to 10^9 except arrays "R", "FR" and "NPM" are restricted to a minimum of 0.01 to avoid division by zero during calculations.

There are 58 arrays in the Equipment LCC model. The listing of the arrays by dimension type are as follows:

(a) The 44 arrays subscripted by "I" and dimensioned by "Y" (which has a range from 1 to 30) are as follows:

AD	ADC	ADG	ATU	CS	DCD	DCE
DCH	DCPM	DCS	DCST	DCTE	DGPM	DGTA
DGTE	DGTT	DR	FMS	FOS	FR	IRCON
IROM	IRPROC	IRRD	ISSD	ISSI	LO	LM
LP	MSSD	MSSI	N	NC	NN	NOH
NPO	PMG	PSS	PTE	PTI	PTM	PTO
PTP	STE					

(b) The 11 arrays subscripted by "K" and dimensioned by "NK" (which has a range from 1 to 500) are as follows:

CST	DC	DSC	LSD	LSI	LSO	QTY
R	RSS	RW	W			

(c) The 3 arrays subscripted by "N" and dimensioned by "NM" (which has a range from 1 to 10) are as follows:

LPM MPM NPM

An alphabetically sequenced Life Cycle Cost Directory with names and descriptions of the Cost Factors is provided in table V.1.

Table V.2 presents the Life Cycle Cost Factor-Equation Directory which provides a cross reference of the Cost Factors and the Equations in which they are used.

LIFE CYCLE COST FACTOR DIRECTORY

NAME	DESCRIPTION
AD(I)	Acquisition cost of data during investment period ($/yr)
ADC(I)	Government payments to the contractor for technical and Managerial work performed during validation phase ($/year)
ADG(I)	Government expenditures for technical and managerial work performed during validation phase ($/yr)
ATU(I)	Acquisition, transportation, and installation costs of training aids and devices during initial training ($/yr)
BY	Base year during/from which all cost adjustments are made (Dimensionless)
CE	Energy consumption cost incurred during the operation of the prime equipment ($/hr/equip)
CIPE	Installation cost of the prime equipment ($/equip)
CM	Cost of materials consumed during the operation of the prime equipment
CP	Average cost per page of set-up, reproduction and distribution of technical manuals ($/page/copy)
CS(I)	Software maintenance cost during prime equipment operation ($/yr)
CSD	Area cost for depot level maintenance ($/sq.ft/yr)
CSI	Area cost for O/I level maintenance space ($/sq.ft./yr)

Table V.1

NAME	DESCRIPTION
CSO	Area cost for operational space ($/sq.ft./yr)
CST(K)	Unit cost of the Kth spare/repair item ($/item)
CTI	Average instructor training cost for personnel pay and allowance travel and course fees ($/student)
CTM	Average O/I maintenance personnel training cost for pay and allowance, travel and course fees ($/student)
CTO	Average operating personnel training costs for pay and allowance, travel and course fees ($/student)
CTP	Average depot maintenance personnel training costs for pay and allowance, travel and course fees ($/student)
CTPE	Transportation cost of prime equipment from contractors facility to installation site ($/equip)
CU	Unit price of one of the contractors equipment ($/equip)
DC(K)	Duty cycle in the Kth spare/repair item (Ratio)
DCD(I)	Payment by the government to the contractor for all the data acquired during full scale development ($/yr)
DCE(I)	Payment by the government to the contractor for the engineering efforts during full scale development ($/yr)

Table V.1 (continued)

NAME	DESCRIPTION
DCH(I)	Payment by the government to the contractor hardware development efforts during full scale development ($/yr)
DCPM(I)	Payment by the government to the contractor management efforts during full scale development ($/yr)
DCS(I)	Payment by the government to the contractor software development effort during full scale development ($/yr)
DCST(I)	Payment by the government to the contractor S&TE development effort during full scale development ($/yr)
DCTE(I)	Payment by the government to the contractor test and evaluation efforts during full scale development ($/yr)
DGPM(I)	Government project management costs incurred during full scale development ($/yr)
DGTA(I)	Government costs for test site activation/deactivation during full scale development T&E program ($/yr)
DGTE(I)	Government personnel costs incurred during full scale development T&E program for testing and evaluation ($/yr)
DGTT(I)	Government cost to train students during full scale development test and evaluation program ($/yr)
DR(I)	Annual discount rate for future costs (ratio)

Table V.1 (continued)

NAME	DESCRIPTION
DSC(K)	Discard rate of the Kth spare/repair item (ratio)
FDRT	Required stockage time for depot level repairable items at O/I and depot level (days)
FILS	Required stockage time for replenishment spares at O/I level (days)
FIRT	Repair cycle time for repairable items at O/I level (days)
FM	Repair material rate (ratio)
FMS(I)	Maintenance site construction/preparation costs during investment period ($/yr)
FOS(I)	Operational site construction/preparation costs during investment period ($/yr)
FPST	Procurement lead and safety level stockage time for initial spare and repair parts (days)
FR(I)	Reliability improvement or degridation factor (dimensionless)
IRCON(I)	Annual inflation rate for future costs for construction type of funding (ratio)
IROM(I)	Annual inflation rate for future costs of O&M type of funding (ratio)
IRPROC(I)	Annual inflation rate for future costs of procurement type funding (ratio)
IRRD(I)	Annual inflation rate for future costs of R&D type of funding (ratio)

Table V.1 (continued)

NAME	DESCRIPTION
ISSD(I)	Storage space required for the depot inventory (sq.ft./yr)
ISSI(I)	Storage space required for the O/I inventory (sq.ft./yr)
IYI	Year during which initial cost occur (dimensionless)
LO(I)	Desired manning level for operating personnel (personnel/yr)
LM(I)	Desired manning level for O/I level maintenance personnel (personnel/yr)
LP(I)	Desired manning level for depot level maintenance personnel (personnel/yr)
LPM(N)	Preventive maintenance labor time for Nth maintenance action (hr/action)
LSD(K)	Depot maintenance labor time to repair the Kth item (hr/item)
LSI(K)	O/I level maintenance labor time to repair the Kth item (hr/item)
LSO(K)	O/I level maintenance labor time to remove and replace the Kth item (hr/item)
MPM(N)	Material cost for Nth type of preventive maintenance action ($/action)
MSSD(I)	Shop space required for depot level maintenance (sq.ft./yr)
MSSI(I)	Shop space required for O/I level maintenance (sq. ft./yr)

Table V.1 (continued)

NAME	DESCRIPTION
N(I)	Number of equipments in the Navy's inventory system (equip/yr)
NC(I)	Number of copies of technical data to be distributed and inventoried (copies/yr)
NK	Total number of spare/repair items in the prime equipment (dimensionless)
NM	Total number of preventive maintenance types of the prime equipment (dimensionless)
NN(I)	Prime equipment annual acceptance schedule (equip/yr)
NOH(I)	Prime equipment overhaul schedule (equip/yr)
NP	Number of pages per technical manual maintained by Navy (pages/copy)
NPM(N)	Time between inspections of the preventive maintenance actions (hr/action)
NPO(I)	Prime equipment phase out schedule (equip/yr)
NSNP	Total number of new National Stock Numbers to be issued on the prime equipment (NSN)
NSNS	Total number of new National Stock Numbers to be issued on the peculiar S&TE equipments (NSN)
OHL	Prime equipment overhaul maintenance labor time (hr/equip)
OHM	Prime equipment overhaul maintenance material cost ($/equip)

Table V.1 (continued)

NAME	DESCRIPTION
OHT	Prime equipment overhaul maintenance material shipping rate ($/equip)
OT	Prime equipment annual operating time (hrs/equip/yr)
PMG(I)	Government project management costs incurred during investment period ($/yr)
PO	Number of personnel required to operate a prime equipment (personnel/equip)
PSOS	Floor space required for the operation of a prime equipment (sq.ft./equip)
PSS(I)	Production support & services cost incurred during the investment period ($/yr)
PTE(I)	Production test & evaluation costs incurred during the investment period ($/yr)
PTI(I)	Number of instructors to receive initial training (student/yr)
PTM(I)	Number of O/I Maintenance personnel to receive initial training (student/yr)
PTO(I)	Number of operating personnel to receive initial training (student/yr)
PTP(I)	Number of depot maintenance personnel to receive initial training (student/yr)
QTY(K)	Number of quantities of a spare/repair item (quantity/item)
R(K)	Mean time between failures of the spare/repair item (hr/item)

Table V.1 (continued)

NAME	DESCRIPTION
RAM	Operator and O/I level maintenance personnel attrition rate (ratio)
RAP	Depot level maintenance personnel attrition rate (ratio)
RDM	Technical data management cost for file maintenance ($/page/yr)
RIE	Average National Stock Number (NSN) entry cost into the supply system ($/NSN)
RIM	Supply support management item retention and field administration cost ($/NSN)
RO	Prime equipment operator hourly pay rate ($/hr/operator)
RPL	Packaging labor cost ($/lb)
RPM	Packaging material cost ($/lb)
RSD	Depot Maintenance personnel pay rate to repair items ($/hr/man)
RSL	O/I maintenance personnel pay rate to remove, replace or repair failed items ($/hr/man)
RSR	Average shipping cost ($/lb)
RSS(K)	Fraction of failures repaired at the intermediate maintenance level for the Kth item (ratio)
RW(K)	Ratio of the shipping weight to the unpacked weight of the Kth item (ratio)
STE(I)	Support & test equipment acquisition cost ($/yr)

Table V.1 (continued)

NAME	DESCRIPTION
STEM	Support & test equipment initial support rate, percent of S&TE acquisition cost (ratio)
STES	Support & test equipment recurring support cost per prime equipment ($/equip)
TERM	Termination cost and/or value of the prime equipment ($/equip)
W(K)	Unpacked weight of the Kth item (lb/item)
Y	Number of years covered by the life cycle analysis (dimensionless)

Table V.1 (continued)

LIFE CYCLE COST FACTOR-EQUATION REFERENCE DIRECTORY

NAME	CBS NUMBER
AD(I)	234100
ADC(I)	111000
ADG(I)	112000
ATU(I)	235500
BY	ALL
CE	313000
CIPE	225000
CM	314000
CP	234200
CS(I)	315000
CSD	325120 325220
CSI	325110 325210
CSO	312000
CST(K)	232110 321200 327100
CTI	235400
CTM	235200 328200
CTO	235100 328100
CTP	235300 328300
CTPE	224000
CU	221000
DC(K)	232110 321110 321120 321130 321200 321310 321320 321330 327100
DCD(I)	121600
DCE(I)	121200
DCH(I)	121300
DCPM(I)	121100
DCS(I)	121400
DCST(I)	121700
DCTE(I)	121500
DGPM(I)	122100
DGTA(I)	122220
DGTE(I)	122230
DGTT(I)	122210
DR(I)	ALL
DSC(K)	232110 321120 321130 321200 321310 321320 321330 327100

Table V.2

NAME	CBS NUMBER
FDTR	232110
FILS	232110
FIRT	232110
FM	321200
FMS(I)	233200
FOS(I)	233100
FPST	232110
FR(I)	232110
	321110
	321120
	321130
	321200
	321310
	321320
	321330
	327100
IRCON(I)	122220
	233100
	233200
	312000
	325110
	325120
	325210
	325220
IROM(I)	122210
	232200
	235100
	235200
	235300
	235400
	311000
	313000
	314000
	315000
	321110
	321120
	321130
	321200

NAME	CBS NUMBER
IROM(I) (cont.)	321310
	321320
	321330
	322100
	322200
	323100
	323200
	323300
	324000
	326000
	327100
	327200
	328100
	328200
	328300
	330000
IRPROC(I)	221000
	222000
	223000
	224000
	225000
	231000
	232110
	232120
	234100
	234200
	235500
IRRD(I)	111000
	112000
	121100
	121200
	121300
	121400
	121500
	121600
	121700
	122100
	122230
	210000
ISSD(I)	325220
ISSI(I)	325210
IYI	232200
	326000
	327200

Table V.2 (cont.)

NAME	CBS NUMBER
LO(I)	328100
LM(I)	328200
LP(I)	328300
LPM(N)	322100
LSD(K)	321130
LSI(K)	321120
LSO(K)	321110
MPM(N)	322200
MSSD(I)	325120
MSSI(I)	325110
N(I)	311000 312000 313000 314000 321110 321120 321130 321200 321310 321320 321330 322100 322200 324000 327100
NC(I)	234200
NK	232110 321110 321120 321130 321200 321310 321320 321330 327100
NM	322100 322200
NN(I)	221000 224000 225000 232110
NOH(I)	323100 323200 323300
NP	234200 326000
NPM(N)	322100 322200
NPO(I)	330000
NSPN	232200 327200
NSNS	232200 327200
OHL	323100
OHM	323200
OHT	323300
OT	232110 311000 313000 314000 321110 321120 321130 321200 321310 321320 321330 322100 322200 327100

Table V.2 (cont.)

NAME	CBS NUMBER
PMG(I)	210000
PO	311000
PSOS	312000
PSS(I)	222000
PTE(I)	223000
PTI(I)	235400
PTM(1)	235200
PTO(I)	235100
PTP(I)	235300
QTY(K)	232110 321110 321120 321130 321200 321310 321320 321330 327100
R(K)	232110 321110 321120 321130 321200 321310 321320 321330 327100
RAM	328100 328200
RAP	328300
RDM	326000
RIE	232200
RIM	327200
RO	311000
RPL	321310
RPM	321320
RSD	321130 323100
RSL	321110 321120 322100
RSR	321330
RSS(K)	232110 321120 321130 321310 321320 321330
RW(K)	321330
STE(I)	231000 232120
STEM	232120
STES	324000
TERM	330000
W(K)	321310 321320 321330
Y	ALL

Table V.2 (cont.)

E. Sensitivity Analysis Card

Variables to be sensitized are noted on the sensitivity analysis card. These cards are identified by punching SA in columns 1 and 2.

The mnemonic of the variable to be sensitized is entered in columns 10 through 17. The lower and upper values of the range over which the variable is to be sensitized are entered in columns 20 through 29 and 30 through 39 respectively.

Up to ten scalar variables and up to ten array variables may be sensitized in a given program execution.

The sensitivity analysis for a scalar begins by setting the variable to the lower range value, performing the model calculations, and printing a line of output. The process is repeated ten times successively adding 1/10 of the range to the variable's value.

The sensitivity analysis for an array variable begins by multiplying all original elements of the array by a multiplier initially set equal to the lower range value, performing the model calculations, and printing a line of output. The process is repeated ten times successively adding 1/10 of the range to the multiplier. Array elements are subsequently printed giving the original and eleven modified values of each element.

If more than ten scalars or ten arrays are used

for sensitivity analysis, the excess will be ignored and a warning message issued for each.

VI. FLEX TECHNIQUE IN LCC METHODOLOGY

FLEX option of the NAVMAT Equipment LCC Model provides the analyst the flexibility to modify the standard LCC model to his specific project needs. It is realized that within the limits of the standard LCC model it is not feasible to cover a wide range of possible unique situations of every project. With this in mind, the FLEX technique is introduced. Using this technique, the analyst can modify the standard LCC model to the extent of even redefining the entire cost structure. However, this is neither intended nor recommended. The user should stay within the same framework of the standard cost model and add or delete cost elements, define and use new variables, or make use of other miscellaneous options provided by the flex technique to emphasize certain cost areas or make some changes in the cost calculation methodology that is more fitting to his specific project. Run Deck sequence of the computer program is shown in Figure V.1. A flex technique sample computer run is provided in Appendix E. The basic optional changes of the flex technique are as follows:

A. Revision, Addition, Or Deletion Of Cost Elements

Revision, addition, or deletion of a cost element is done by providing a "CS" card in the "CS" file (refer

to figure V.1). The format of a "CS" card is as follows:

Column(s)	Description
1-2	Card type "CS"
3-8	Cost Breakdown Structure number
9-10	Not used
11-50	Cost element description
51-54	Not used
55-56	Cost category
57-59	Not used
60	Funding type
61-64	Not used
65	Inflation factor type
66-69	Not used
70	Equation code
71-79	Not used
80	Deletion code

Code numbers of cost categories, funding types, and inflation factor types are provided in section II.

1. Revision

If the analyst wants to maintain the cost element but make changes in the description, cost category, funding type, or inflation factor type, he must prepare a "CS" card and identify the cost breakdown structure number and modify only the changes to be implemented.

2. Addition

If the user is introducing a new cost element, he should prepare a "CS" card, and by using the standard LCC model as a reference, define a cost breakdown structure number. If the cost element is not the lowest indenture level, a cost breakdown structure number and description of the cost element is all that is needed. However, if the cost element

is at the lowest indenture level, then the analyst must provide the information associated with the cost category, funding type, inflation factor type and also indicate that an equation card will follow the "CS" card (Lowest indenture level cost elements must have equations). The computer program is dimensioned to accept 100 new cost elements.

3. Deletion

If the analyst wants to delete a cost element, he prepares a CS card, defines the cost breakdown structure number and punches 1 in the 80th column. Caution: This will delete the cost element specified and also all the lower indenture level cost elements below it. The analyst may use the deleted cost structure numbers for new cost element definitions. Note: If a standard LCC model cost factor is deleted thru deletion of cost elements not being used again, it may be excluded from the NAMELIST data.

B. Equations For Cost Elements

Equations are identified with an "EQ" card provided in the same file with "CS" cards. Equations may be provided to modify the existing equations or for new cost elements. In either case, an "EQ" card must follow a "CS" card with the same cost breakdown structure number. Equation card format is as follows:

Column(s)	Description
1-2	Card type "EQ"
3-8	Cost breakdown structure number
9-10	Not used
11-80	Cost equation

Equations may be continued to another card by breaking off at a comma or semicolon and resuming in the next card. A continuation card must be an "EQ" card and must be identified by the same cost breakdown structure number.

Equations are written in Reversed Polish notation in which each operation (+ , - , * , / , **) acts on the two quantities immediately preceding it, working from left to right (many electronic calculators use this technique). Thus A,B,C,+,* represents (B+C)*A. Equation elements are separated by commas. Summation is indicated by the semicolon. The sequence is "subscript, minimum value, maximum value". The subscript "I" always denotes the year and is treated differently. Those years outside the range of "I" are assigned a cost of zero while those within the range are assigned the cost obtained by fixing the value of "I" appropriately and summing over the other subscripts. Samples of equations written in Reversed Polish Notation are:

1.

A(I);I,1,Y

Same as,

$$\sum_{I=1}^{Y} A(I)$$

2.

A(I),B,+,C(J),*,D,E,**,-,F,/;I,1,Y,J,1,N

Same as,

$$\sum_{I=1}^{Y} \sum_{J=1}^{N} [[[A(I) + B] * C(J)] - D^{E}] / F$$

C. New Variables

In new equations, the analyst has the option to use the built-in cost factors defined for the standard cost model or define, describe, and use values for new variables thru the "NV" file (refer to Figure V.1). The computer program is dimensioned to accept 50 new scalars and 50 new arrays. The analyst may use internally defined dimensioning scalars for the new arrays. However, if the analyst defines the dimensioning scalars, they must be read in before any of the arrays dimensioned by it.

1. Variable Description Card

This card is optionally used to describe the user input variables. If one card is not enough, the description of the variable is continued on the next card. A maximum of two cards can be used for each variable. The format of both cards are identical. If two cards are used, they must be consecutive in the "NV" file. "DS" cards may appear anywhere in the file as long as they do not seperate an "NV" card from its continuation. The format of a "DS" card is as follows:

Column(s)	Description
1-2	Card type "DS"
3-4	Not used
5-15	Variable name
16-72	Variable description
73-80	Not used

2. Variable name and value input card ("NV" Card)

Whenever a new variable is used, it must be defined and its value must be used by an "NV" card. An "NV" card may appear anywhere in the "NV" file as long as it does not separate another "NV" card from its continuation. An "NV" card may be continued to another "NV" card by breaking off at a comma (comma signifies the continuation of the card) and resuming on the next "NV" card identified by the same variable name. Variable values are used the same way as in the NAMELIST data input procedures as described in Section V. The format of the "NV" file is as follow:

Column(s)	Description
1-2	Card type "NV"
3-4	Not used
5-15	Variable name
16-80	Variable value

D. Other FLEX Options

1. Cost Categories

The standard LCC cost model provides 10 defaulted cost categories. However, the analyst may vary the number of cost categories from one to twenty, and define the cost

category names at his option. These variables must be used thru the NAMELIST data as shown below:

NOCAT- The number of cost categories (Integer) e.g.,

NOCAT=11,

CAT1,CAT2,.....CAT20- The variables that define the cost category names. The first ten default to the names in the standard LCC cost categories. These variables must be entered in quotes in blocks of maximum 8 characters:

CAT8='FACILITI','ES',

CAT11='MANAGEME','NT',

2. Cost Elements (Cost elements defined in the summary report)

The standard LCC model defaults to three cost elements in the summary report. However, the analyst may vary this by changing the LCC model cost breakdown structure definition. The first number of the cost breakdown structure number determines the number of cost elements in the summary report. Using the FLEX technique the analyst may vary this number from one to six. The reporting format of the computer program automatically adjusts to the changes. The analyst may also change the title of the cost elements in the summary report by using the following variables which must be input thru NAMELIST data:

ELT1,ELT2,.....ELT6- Cost element titles. The first three default to DEVELOPMENT, INVESTMENT, and O&S. These

variables must be entered in quotes with a maximum of 8 characters:

ELT4='OPERATIO','NS',

3. Funding type (Titles for the Funding reports)

The number of funding types are fixed to six. However, the analyst may change the title of the funding type by providing the following variables thru NAMELIST data:

FUND1,FUND2,.....FUND6- Funding titles default to R&D, PROCUREMENT, CONSTRUCTION, O&M, MILITARY, OTHERS. They must be entered in quotes with a maximum of eight characters (e.g. FUND6='SUNK COS','T',).

4. Years

Life cycle cost years are automatically generated in the program from 1 to total number of years 'Y'. However, the analyst may provide alpha-numeric presentation of the years by providing values for the variable 'YEARS' thru NAMELIST data:

Years are read in quotes in block of four characters (e.g. YEARS='BY94','FY95','1996',)

APPENDIX A

NAVMAT EQUIPMENT LCC MODEL EQUATIONS

TOTAL LIFE CYCLE COST is equal to the sum of the following basic equations

---

RESEARCH AND DEVELOPMENT COSTS

CBS 111000
Contractor payments paid by the government for the equipment development effort during the R&D Validation Phase are

$$\sum_{I=1}^{Y} ADC(I)$$

Where;

I	Designator for a specific project year	
Y	Number of years covered by the life cycle cost analysis	
ADC(I)	Contractor payments	($/yr)

CBS 112000
Government expenditures for the equipment development effort during the R&D Validation Phase are

$$\sum_{I=1}^{Y} ADG(I)$$

Where

ADG(I)	Government expenditures	($/yr)

CBS 121100
Contractor Management costs during full scale development effort are

$$\sum_{I=1}^{Y} DCPM(I)$$

Where

DCPM(I)	Contractor Management costs	($/yr)

CBS 121200
Contractor Engineering costs during full scale development effort is

$$\sum_{I=1}^{Y} DCE(I)$$

Where
DCE(I) Contractor Engineering costs ($/yr)

CBS 121300
Contractor prototype hardware development costs during full scale development effort are

$$\sum_{I=1}^{Y} DCH(I)$$

Where
DCH(I) Contractor prototype hardware costs ($/yr)

CBS 121400
Contractor software development costs during full scale development effort are

$$\sum_{I=1}^{Y} DCS(I)$$

Where
DCS(I) Contractor Software development costs ($/yr)

CBS 121500
Contractor development Test & Evaluation costs during full scale development effort is

$$\sum_{I=1}^{Y} DCTE(I)$$

Where
DCTE(I) Contractor development Test & Evaluation costs ($/yr)

CBS 121600
Contractor Documentation costs during full scale development effort are

$$\sum_{I=1}^{Y} DCD(I)$$

Where
DCD(I) Contractor Documentation costs ($/yr)

CBS 121700
Contractor Support & Test equipment development costs during full scale development effort are

$$\sum_{I=1}^{Y} DCST(I)$$

Where
DCST(I) Contractor S&TE development costs ($/yr)

CBS 122100
Government Program Management costs during full scale development effort are

$$\sum_{I=1}^{Y} DGPM(I)$$

Where
DGPM(I) Program Management costs ($/yr)

CBS 122210
Training costs incurred by students during Test & Evaluation maintenance program are

$$\sum_{I=1}^{Y} DGTT(I)$$

Where
DGTT(I) Training costs ($/yr)

CBS 122220
Test Site activation/deactivation costs incurred by Government during full scale development Test & Evaluation program are

$$\sum_{I=1}^{Y} DGTA(I)$$

Where
DGTA(I) Test Site activation/deactivation costs ($/yr)

CBS 122230
Test & Evaluation costs incurred by Government during full scale development Test & Evaluation Program are

$$\sum_{I=1}^{Y} DGTE(I)$$

Where
DGTE(I) Test & Evaluation personnel costs ($/yr)

INVESTMENT COSTS

CBS 210000
Government Program Management cost is

$$\sum_{I=1}^{Y} PMG(I)$$

Where
PMG(I) Program Management costs ($/yr)

CBS 221000
Production hardware costs of the Prime Equipment are

$$\sum_{I=1}^{Y} NN(I) * CU$$

Where
NN(I) Prime equipment annual acceptance schedule (equip./yr)
CU Prime equipment procurement price ($/equip.)

CBS 222000
Production Support & Services costs of the prime equipment are

$$\sum_{I=1}^{Y} PSS(I)$$

Where
PSS(I) Production Support & Services costs ($/yr)

CBS 223000
Production Test & Evaluation costs of the prime equipment are

$$\sum_{I=1}^{Y} PTE(I)$$

Where
PTE(I) Production Test & Evaluation costs ($/yr)

CBS 224000
Transportation to installation site expenditures to cover the cost of moving the prime equipment from the contractors facility to the point of installation are

$$\sum_{I=1}^{Y} NN(I) * CTPE$$

Where

NN(I)	Prime equipment annual acceptance schedule	(equip/yr)
CTPE	Transportation costs	($/equip)

CBS 225000
Installation costs for the Prime Equipment are

$$\sum_{I=1}^{Y} NN(I) * CIPE$$

Where

NN(I)	Prime equipment annual acceptance schedule	(equip/yr)
CIPE	Installation costs	($/equip)

CBS 231000
Acquisition costs of Support & Test equipment are

$$\sum_{I=1}^{Y} STE(I)$$

Where

STE(I)	Support & Test equipment acquisition costs	($/yr)

CBS 232110
Acquisition cost of Primary equipment Initial Spares is

$$\sum_{I=1}^{Y} NN(I) * \sum_{K=1}^{NK} OT*DC(K)*QTY(K)*CST(K)*[DSC(K)*(FPST+FILS) + [1-DSC(K)]*[RSS(K)*FIRT+[1-RSS(K)]*FDRT]] / [R(K)*FR(I)*365]$$

Where

NN(I)	Prime equipment annual acceptance schedule (equip/yr)
OT	Prime equipment annual operating time (hrs/equip/year)
DC(K)	Duty cycle of Kth item (ratio)
QTY(K)	Quantity of Kth item (quantity/item)
CST(K)	Unit cost of the Kth item ($/item)
DSC(K)	Discard rate of Kth item (ratio)
FPST	Procurement lead & safety stockage time for spares (days
FILS	Required stockage time at O/I level for spares (days)
RSS(K)	Repair level ratio (ratio)
FIRT	Required stockage time for O/I repairable items (days)
FDRT	Required stockage time for depot repairable items (days)
R(K)	Mean time between failures for Kth item (hrs/failure)
FR(I)	Reliability improvement/degradation factor (factor)
K	Designator for a specific spare/repair item
NK	The number of spare/repair items in an equipment

CBS 232120

Acquisition cost of Support & Test Equipment Initial Spares is

$$\sum_{I=1}^{Y} STE(I) * STEM$$

Where

STE(I)	Support & Test equipment acquisition costs ($/yr)
STEM	Material support rate . Percent of S&TE cost (ratio)

CBS 232200
Introduction of new NSN's (National Stock Number) into the supply system costs are

$$\sum_{I=IYI}^{IYI} (NSNP + NSNS) * RIE$$

Where
NSNP Number of new NSN's of Primary Equipment (NSN)
NSNS Number of new NSN's of Support & Test Equipment (NSN)
RIE Average NSN entry into the supply system cost ($/NSN)

CBS 233100
Facility costs incurred by the Government to construct/prepare the operational sites are

$$\sum_{I=1}^{Y} FOS(I)$$

Where
FOS(I) Operational site const/prep. costs ($/yr)

CBS 233200
Facility costs incurred by the government to construct/prepare maintenance sites are

$$\sum_{I=1}^{Y} FMS(I)$$

Where
FMS(I) Maintenance site constr/prep. costs ($/yr)

CBS 234100
Acquisition costs of Technical Data not included in the development costs are

$$\sum_{I=1}^{Y} AD(I)$$

Where
AD(I) Technical Data Acquisition costs ($/yr)

CBS 234200
Reproduction and Distribution costs of Technical Data are

$$\sum_{I=1}^{Y} NC(I) * NP * CP$$

Where

NC(I)	Number of copies	(copies/yr)
NP	Number of pages in a set of technical data	(pages)
CP	Reproduction and distribution costs	($/page/copy)

CBS 235100
Operating personnel pay, allowance, travel costs,and course fees incurred during the initial operator training course are

$$\sum_{I=1}^{Y} PTO(I) * CTO$$

Where

PTO(I)	Number of students	(students/yr)
CTO	Operating personnel training cost	($/student)

CBS 235200
O/I level maintenance personnel pay, allowance,travel costs, and course fees incurred during the initial training course are

$$\sum_{I=1}^{Y} PTM(I) * CTM$$

Where

PTM(I)	Number of students	(students/yr)
CTM	O/I Maintenance personnel training cost	($/student)

CBS 235300
Depot level maintenance personnel pay, allowance,travel costs, and course fees incurred during the initial training course are

$$\sum_{I=1}^{Y} PTP(I) * CTP$$

Where
PTP(I) Number of students (students/yr)
CTP Depot Maintenance personnel training cost ($/student)

CBS 235400
Instructor training personnel pay, allowance,travel costs, and course fees incurred during the initial training course are

$$\sum_{I=1}^{Y} PTI(I) * CTI$$

Where
PTI(I) Number of students (students/yr)
CTI Instructor training cost ($/student)

CBS 235500
Acquisition and installation costs of training aids of the initial training program are

$$\sum_{I=1}^{Y} ATU(I)$$

Where
ATU(I) Acquisition and installation costs of training aids ($)

OPERATING AND SUPPORT COST

CBS311000
Personnel pay and allowance costs incurred by the equipment operators are

$$\sum_{I=1}^{Y} N(I) * PO * RO * OT$$

Where

N(I)	Prime equipment inventory	(equip/yr)
PO	Number of operators per prime equipment	(operator/equip)
RO	Operator hourly pay rate	($/hr/operator)
OT	Prime Equipment operating time	(hrs/equip/yr)

CBS 312000
Facility space costs for providing necessary operational area for the equipment are

$$\sum_{I=1}^{Y} N(I) * PSOS * CSO$$

Where

N(I)	Prime equipment inventory	(equip/yr)
PSOS	Operational area per prime equipment	(sq.ft./equip)
CSO	Operational area space cost	($/sq.ft./yr)

CBS 313000
Energy cost incurred during the equipment operation is

$$\sum_{I=1}^{Y} N(I) * CE * OT$$

Where

N(I)	Prime equipment inventory	(equip/yr)
CE	Energy cost	($/hrs/equip)
OT	Prime Equipment operating time	(hrs/equip/yr)

CBS 314000
Material costs incurred during the equipment operation are

$$\sum_{I=1}^{Y} N(I) * CM * OT$$

Where
- N(I) Prime equipment inventory (equip/yr)
- CM Material cost ($/hr/equip)
- OT Prime equipment operating time (hrs/equip/yr)

CBS 315000
Software maintenance costs incurred during the equipment operation are

$$\sum_{I=1}^{Y} CS(I)$$

Where
- CS(I) Prime equipment software maintenance costs ($/yr)

CBS 321110
O/I level Corrective Maintenance Labor costs for the detection, isolation, removal and replacement of item failures in the prime equipment are

$$\sum_{I=1}^{Y} N(I) * \sum_{K=1}^{NK} OT*DC(K)*QTY(K)*LSO(K)*RSL / [R(K)*FR(I)]$$

Where
- N(I) Prime equipment inventory (equip/yr)
- OT Prime equipment operating time (hrs/equip/yr)
- DC(K) Duty cycle of Kth item (ratio)
- QTY(K) Quantity of Kth item (quantity/item)
- LSO(K) O/I maintenance time to remove,replace Kth item (hrs/item)
- RSL O/I maintenance personnel pay rate ($/hr)
- R(K) Mean time between failures for Kth item (hrs/failure)
- FR(I) Reliability improvement/degradation factor (factor)

CBS 321120
O/I level Corrective Maintenance Labor costs incurred during the repair of a failed item are

$$\sum_{I=1}^{Y} N(I) * \sum_{K=1}^{NK} OT*DC(K)*QTY(K)*LSI(K)*RSL*RSS(K)[1-DSC(K)] / [R(K)*FR(I)]$$

Where

N(I)	Prime equipment inventory (equip/yr)
OT	Prime equipment operating time (hrs/equip/yr)
DC(K)	Duty cycle of Kth item (ratio)
QTY(K)	Quantity of Kth item (quantity/item)
LSI(K)	O/I maintenance time to repair the Kth item (hrs/item)
RSL	O/I maintenance personnel pay rate ($/hr)
RSS(K)	Repair level ratio (ratio)
DSC(K)	Discard rate of Kth item (ratio)
R(K)	Mean time between failures of Kth item (hrs/failure)
FR(I)	Reliability improvement/degradation factor (factor)

CBS 321130
Depot level Corrective Maintenance costs incurred during the repair of a failed item are

$$\sum_{I=1}^{Y} N(I) * \sum_{K=1}^{NK} OT*DC(K)*QTY(K)*LSD(K)*RSD*[1-RSS(K)]*[1-DSC(K)] / [R(K)*FR(I)]$$

Where

N(I)	Prime equipment inventory (equip/yr)
OT	Prime equipment operating time (hrs/equip/yr)
DC(K)	Duty cycle of Kth item (ratio)
QTY(K)	Quantity of Kth item (quantity/item)
LSD(K)	Depot maintenance time to repair Kth item (hrs/item)
RSD	Depot maintenance personnel pay rate ($/hr)
RSS(K)	Repair level ratio (ratio)
DSC(K)	Discard rate of Kth item (ratio)
R(K)	Mean time between failures of Kth item (hrs/failure)
FR(I)	Reliability improvement/degradation factor (factor)

CBS 321200
Corrective Maintenance Repair Material costs are

$$\sum_{I=1}^{Y} N(I) * \sum_{K=1}^{NK} OT*DC(K)*QTY(K)*CST(K)*FM*[1-DSC(K)] / [R(K)*FR(I)]$$

Where

N(I)	Prime equipment inventory (equip/yr)
OT	Prime equipment operating time (hrs/equip/yr)
DC(K)	Duty cycle of Kth item (ratio)
QTY(K)	Quantity of Kth item (quantity/item)
CST(K)	Unit cost of the Kth item ($/item)
FM	Repair material rate. Percent of item cost (ratio)
DSC(K)	Discard rate of Kth item (ratio)
R(K)	Mean time between failures of Kth item (hrs/failure)
FR(I)	Reliability improvement/degradation factor (factor)

CBS 321310
Packaging Labor costs incurred during the process of shipping failed items between the intermediate and depot level maintenance facilities are

$$\sum_{I=1}^{Y} N(I) * \sum_{K=1}^{NK} OT*DC(K)*QTY(K)*2*W(K)*RPL*[1-RSS(K)] * [1-DSC(K)] / [R(K)*FR(I)]$$

Where

N(I)	Prime equipment inventory (equip/yr)
OT	Prime equipment operating time (hrs/equip/yr)
DC(K)	Duty cycle of Kth item (ratio)
QTY(K)	Quantity of Kth item (quantity/item)
W(K)	Weight of Kth item (#)
RPL	Packaging labor cost ($/#)
RSS(K)	Repair level ratio (ratio)
DSC(K)	Discard rate of Kth item (ratio)
R(K)	Mean time between failures of Kth item (hrs/failure)
FR(I)	Reliability improvement/degradation factor (factor)

CBS 321320
Packaging Material cost incurred during the process of shipping failed items between the intermediate and depot level maintenance facilities are

$$\sum_{I=1}^{Y} N(I) * \sum_{K=1}^{NK} OT*DC(K)*QTY(K)*2*W(K)*RPM*[1-RSS(K)] * [1-DSC(K)] / [R(K)*FR(I)]$$

Where

N(I)	Prime equipment inventory (equip/yr)
OT	Prime equipment operating time (hrs/equip/yr)
DC(K)	Duty cycle of Kth item (ratio)
QTY(K)	Quantity of Kth item (quantity/item)
W(K)	Weight of Kth item (#)
RPM	Packaging material cost ($/#)
RSS(K)	Repair level ratio (ratio)
R(K)	Mean time between failures of Kth item (hrs/failure)
FR(I)	Reliability improvement/degradation factor (factor)

CBS 321330
Shipping cost incurred during the transportation of failed items between the intermediate and depot level maintenance facilities are

$$\sum_{I=1}^{Y} N(I) * \sum_{K=1}^{NK} OT*DC(K)*QTY(K)*2*W(K)*RSR*RW(K)*[1-RSS(K)]* [1-DSC(K)] / [R(K)*FR(I)]$$

Where

N(I)	Prime equipment inventory (equip/yr)
OT	Prime equipment operating time (hrs/equip/yr)
DC(K)	Duty cycle of Kth item (ratio)
QTY(K)	Quantity of Kth item (quantity/item)
W(K)	Weight of Kth item (#)
RSR	Shipping cost ($/#)
RW(K)	Item packing weight ratio (shipping Wt/unpacked Wt)
RSS(K)	Repair level ratio (ratio)
DSC(K)	Discard rate of Kth item (ratio)
R(K)	Mean time between failures of Kth item (hrs/failure)
FR(I)	Reliability improvement/degradation factor (factor)

CBS 322100
Preventive Maintenance Labor costs are

$$\sum_{I=1}^{Y} N(I) * \sum_{N=1}^{NM} OT * LPM(N) * RSL / NPM(N)$$

Where

N(I)	Prime equipment inventory (equip/yr)
OT	Prime equipment operating time (hrs/equip/yr)
LPM(N)	Maintenance time of Nth type PM action (hrs/equip/action)
RSL	O/I maintenance personnel pay rate ($/hr)
NPM(N)	Time between inspections of Nth type PM (hrs/action)
N	Designator for a specific preventive maintenance type
NM	Number of preventive maintenance types

CBS 322200
Preventive Maintenance Material costs are

$$\sum_{I=1}^{Y} N(I) * \sum_{N=1}^{NM} OT * MPM(N) / NPM(N)$$

Where

N(I)	Prime equipment inventory (equip/yr)
OT	Prime equipment operating time (hrs/equip/yr)
MPM(N)	Material cost of Nth type PM action ($/equip/action)
NPM(N)	Time between inspections of Nth type PM (hrs/action)
N	Designator of a specific preventive maintenance type
NM	Number of preventive maintenance types

CBS 323100
Prime equipment Overhaul Maintenance Labor costs are

$$\sum_{I=1}^{Y} NOH(I) * OHL * RSD$$

Where

NOH(I)	Prime equipment overhaul schedule (equip/yr)
OHL	Overhaul maintenance time (hrs/equip)
RSD	Depot maintenance pay rate ($/hr)

CBS 323200
Prime equipment Overhaul Maintenance Material costs are

$$\sum_{I=1}^{Y} NOH(I) * OHM$$

Where

NOH(I)	Prime equipment overhaul Schedule (equip/yr)
OHM	Overhaul maintenance material cost ($/equip)

CBS 323300
Transportation of material costs for shipping equipment and other items during Prime equipment overhaul are

$$\sum_{I=1}^{Y} NOH(I) * OHT$$

Where

NOH(I)	Prime equipment overhaul schedule (equip/yr)
OHT	Material shipping rate ($/equip)

CBS 324000
Support & Test Equipment Maintenance Labor and Material costs are

$$\sum_{I=1}^{Y} N(I) * STES$$

Where

N(I)	Prime equipment inventory (equip/yr)
STES	Recurring support cost of S&TE ($/prime equip)

CBS 325110
O/I level maintenance shop space costs are

$$\sum_{I=1}^{Y} MSSI(I) * CSI$$

Where
MSSI(I) O/I maintenance shop space (sq. ft./yr)
CSI O/I maintenance space cost ($/sq. ft.)

CBS 325120
Depot level maintenance shop space costs are

$$\sum_{I=1}^{Y} MSSD(I) * CSD$$

Where
MSSD(I) Depot maintenance shop space (sq. ft/yr)
CSD Depot maintenance space cost ($/sq. ft.)

CBS 325210
O/I level maintenance material storage costs are

$$\sum_{I=1}^{Y} ISSI(I) * CSI$$

Where
ISSI(I) O/I maintenance material storage space (sq. ft./yr)
CSI O/I maintenance space cost ($/sq. ft.)

CBS 325220
Depot level maintenance material storage costs are

$$\sum_{I=1}^{Y} ISSD(I) * CSD$$

Where
ISSD(I) Depot maintenance material storage space (sq. ft./yr)
CSD Depot maintenance space cost ($/sq. ft.)

CBS 326000
Technical data maintenance costs for managing the technical data distribution center are

$$\sum_{I=IYI}^{Y} NP * RDM$$

Where

NP	Number of pages in a set of technical data	(pages)
RDM	Technical data management costs	($/page)
IYI	Initial year	

CBS 327100
Corrective Maintenance Replenishment Spares costs are

$$\sum_{I=1}^{Y} N(I) * \sum_{K=1}^{NK} OT*DC(K)*QTY(K)*CST(K)*DSC(K) / [R(K)*FR(I)]$$

Where

N(I)	Prime equipment inventory	(equip/yr)
OT	Prime equipment operating time	(hrs/equip/yr)
DC(K)	duty cycle of Kth item	(ratio)
QTY(K)	Quantity of Kth item	(quantity/item)
CST(K)	Unit cost of the Kth item	($/item)
DSC(K)	Discard rate of Kth item	(ratio)
R(K)	Mean time between failures of Kth item	(hrs/failure)
FR(I)	Reliability improvement/degradation factor	(factor)

CBS 327200
Supply support management costs are

$$\sum_{I=IYI}^{Y} [NSNP + NSNS] * RIM$$

Where

NSNP	Number of new NSNs for prime equipment	(NSN)
NSNS	Number of new NSNs for S&TE equipment	(NSN)
RIM	Supply support management costs	($/NSN)
IYI	Initial year	

CBS 328100
Operator course pay and allowance costs incurred by students during training period are

$$\sum_{I=1}^{Y} LO(I) * RAM * CTO$$

Where

LO(I)	Manning level of operating personnel	(personnel/yr)
RAM	Personnel attrition rate	(ratio)
CTO	Operator training cost	($/student)

CBS 328200
O/I level maintenance personnel pay and allowance costs incurred by students during training period are

$$\sum_{I=1}^{Y} LM(I) * RAM * CTM$$

Where

LM(I)	Manning level of O/I maintenance personnel	(personnel/yr)
RAM	Personnel attrition rate	(ratio)
CTM	O/I maintenance personnel training cost	($/student)

CBS 328300
Depot level maintenance personnel pay and allowance costs incurred by students during training period are

$$\sum_{I=1}^{Y} LP(I) * RAP * CTP$$

Where

LP(I)	Manning level of Depot maintenance personnel	(personnel/yr)
RAP	Personnel attrition rate	(ratio)
CTP	Depot maintenance personnel training cost	($/student)

CBS 330000
Termination cost/value of the Prime equipment is

$$\sum_{I=1}^{Y} NPO(I) * TERM$$

Where

NPO(I)	Prime equipment phase out schedule (equip/yr)
TERM	Prime equipment net terminal cost/value ($/equip)

APPENDIX B

Life Cycle Cost factor

Names, Descriptions, Dimensions, and Sources

Life Cycle Cost Factors

Names, Descriptions, Dimensions and Sources

The material in this appendix contains a listing of the 104 Cost Factors used in the NAVMAT LCC Model. Names, Descriptions, Dimensions and the source of information have been identified for all the Cost Factors. These major sources are:

1. Program Management Office (PMO)
2. Program Manager for Logistics (PM(L)) and/or his/her Logistic Managers
3. The Contractor
4. Analyst

Name	AD(I)
Description	Acquisition cost of data during Investment in year I. This refers to acquiring, writing, assembling, reformating technical manuals and other documentation not covered during Research & Development phase.
Dimension	$/year
Source	PMO

Name	ADC(I)
Description	Government payments to the contractor for technical and managerial work performed during the Validation phase of the Research & Development in year I.
Dimension	$/year
Source	PMO

Name	ADG(I)
Description	Government expenditures for technical and managerial work performed during the Validation phase of the Research & Development in year I.
Dimension	$/year
Source	PMO

Name	ATU(I)
Description	Acquisition, transportation, and installation costs of training aids and devices to conduct operator, maintenance personnel, and instructor training courses during initial training program in year I.
Dimension	$/year
Source	PM(L)

Name	BY
Description	Base year during/from which all cost adjustments are made.
Dimension	Dimensionless
Source	PMO

Name	CE
Description	Energy consumption cost incurred during the operation of the prime equipment.
Dimension	$/hr/equip
Source	PM(L) & Contractor

Name	CIPE
Description	Installation cost of the prime equipment (If not covered by the acquisition cost). This cost refers to the material and services involved in assembling the equipment and complete checkout to assure achievement of operational status.
Dimension	$/equip
Source	PM(L)

Name	CM
Description	Cost of materials consumed during the operation of the prime equipment.
Dimension	$/hr/equip
Source	PM(L) & contractor

Name	CP
Description	Average cost per page of set-up, reproduction, and distribution of technical manuals.
Dimension	$/page/copy
Source	PM(L)

Name	CS(I)
Description	Software maintenance cost during prime equipment operation in year I.
Dimension	$/year
Source	PM(L)

Name	CSD
Description	Area cost for depot level maintenance space
Dimension	$/sq.ft./year
Source	PM(L)

Name	CSI
Description	Area cost for O/I level maintenance space
Dimension	$/sq.ft./year
Source	PM(L)

Name	CSO
Description	Area cost for Operational space.
Dimension	$/sq.ft./year
Source	PM(L)

Name	CST(K)
Description	Unit cost of the Kth spare/repair item.
Dimension	$/item
Source	PM(L)

Name	CTI
Description	Average cost incurred during instructor training course for personnel pay & allowance, travel, and course fees.
Dimension	$/student
Source	PM(L)

Name	CTM
Description	Average cost incurred during O/I maintenance personnel training course for personnel pay & allowance, travel and course fees.
Dimension	$/student
Source	PM(L)

Name	CTO
Description	Average cost incurred during operating personnel training course for personnel pay & allowance, travel, and course fees.
Dimension	$/student
Source	PM(L)

Name	CTP
Description	Average cost incurred during depot maintenance personnel training course for personnel pay & allowance travel, and course fees.
Dimension	$/student
Sourse	PM(L)

Name	CTPE
Description	Transportation cost of prime equipment from contractors facility to installation site (if not included in acquisition cost). This includes the packaging and transportation of the prime equipment from the contractors facility to the first destination, and then to the second destination (operation site).
Dimension	$/equip
Source	PM(L)

Name	CU
Description	Unit price of the prime equipment. In addition to the prime equipment hardware this cost may include part or all of production support and services costs, and transportation and installation cost of the equipment. (These costs should be identified properly to avoid double counting).
Dimension	$/equip
Source	PMO

Name	DC(K)
Description	Duty cycle of the Kth spare/repair item. Percent of prime equipment operating time.
Dimension	Ratio (Item operating time/Equip. operating time)
Source	PM(L) & Contractor

Name	DCD(I)
Description	Payment by the Government to the Contractor for all the deliverable data acquired during full scale development in year I. The data requirement will normally be selected from the departmental or agency authorized data list. It includes the effort for acquiring, writing, assembling, reformating, production,packaging and shipping Engineering data, Support data, and Management data required by the government.
Dimension	$/year
Source	PMO

Name	DCE(I)
Description	Payments by the Government to the Contractor for the engineering efforts during full scale development in year I. This includes all engineering efforts associated with the equipment design and development. Specifically, the cost of system engineering, and integration, design engineering, design support engineering, and engineering planning costs. It includes the cost of direct labor, material, overhead, and other direct costs incurred during the engineering process.
Dimension	$/year
Source	PMO

Name	DCH(I)
Description	Payments by the Government to the Contractor for the hardware development efforts during full scale development in year I. This includes the fabrication and assembly of full scale development models in support of the engineering design activity. This includes the cost of direct labor, materials and overhead associated with material procurement and handling, tooling and test equipment in support of manufacturing, fabrication, assembly, system integration, and checkout.
Dimension	$/year
Source	PMO

Name	DCPM(I)
Description	Payment by the Government to the Contractor for the Management effort during full scale development in year I. This refers to the costs incurred for planning, organizing, manning, directing, and controlling the technical and administrative activities of the project. This includes the cost of personnel, services, and overhead associated with cost/schedule control, configuration management, data management, contract management, and ILS (Integrated logistic support) management.
Dimension	$/year
Source	PMO

Name	DCS(I)
Description	Payment by the Government to the Contractor for software development effort for the prime equipment during full scale development in year I. This includes the cost of direct labor, material, overhead, and other direct costs associated with the computer software development.
Dimension	$/year
Source	PMO

Name	DCST(I)
Description	Payment by the Government to the Contractor for the development of the Peculiar Support and Test equipment during full scale development in year I. This refers to all costs inclusive of the software costs associated with Peculiar Support & Test equipment.
Dimension	$/year
Source	PMO

Name	DCTE(I)
Description	Payment by the Government to the Contractor Test & Evaluation efforts during full scale development in year I. This refers to the costs which are incurred in support of the government testing (DTE and IOTE) during the full scale development phase of the equipment life cycle. This cost factor may include for example: spares, repair parts, support & test equipment, training, test site activation, facility requirements, and services. Development test and evaluation (DTE) support is designed to determine and/or verify technical performance and safety characteristics of an item, associated tools and test equipment. It includes determination of structural, mechanical, electrical, chemical and other physical properties of the equipment. DTE is generally conducted in contractors facilities. Initial operational test and evaluation (IOTE) support refers to the operational test and evaluation performed during the full scale development prior to the production decision to provide information as to the equipment military use expected operational effectiveness and operational suitability, maintenance concepts, training needs and technical manual suitability. IOTE is generally conducted at Government facilities.
Dimension	$/year
Source	PMO

Name	DGPM(I)
Description	Government project management costs incurred during full scale development in year I. This refers to the technical and administrative planning, organizing, directing, coordinating, controlling, and approval actions designed to accomplish overall program objectives. Examples of these activities are configuration management, cost/schedule management, data management, contract management, and integrated logistic support management.
Dimension	$/year
Source	PMO

Name	DGTA(I)
Description	Government costs for test site activation/deactivation during full scale development Test & Evaluation program in year I. This refers to the costs for test site modification, transportation and installation of the prototype models at the test site, test site operation, restoration and facilities leased or government facilities used during Test & Evaluation program.
Dimension	$/year
Source	PMO

Name	DGTE(I)
Description	Government personnel costs incurred during full scale development Test & Evaluation program for testing and evaluation.
Dimension	$/year
Source	PMO

Name	DGTT(I)
Description	Government costs to train students during full scale development Test & Evaluation program in year I. This refers to the pay & allowance and travel expenses and the course fees and the training facilities provided by the government.
Dimension	$/year
Source	PMO

Name	DR(I)
Description	Annual discount rate for future costs in year I.
Dimension	Ratio
Source	PMO & Analyst

Name	DSC(K)
Description	Discard rate of the Kth spare/repair item.
Dimension	Ratio
Source	PM(L) & Contractor

Name	FDRT
Description	Required stockage time for depot level repairable items at O/I and depot level.
Dimension	Days
Source	PM(L)

Name	FILS
Description	Required stockage time for replenishment spares at O/I level.
Dimension	Days
Source	PM(L)

Name	FIRT
Description	Repair cycle time of repairable items at O/I level.
Dimension	Days
Source	PM(L)

Name	FM
Description	Repair material rate.
Dimension	Ratio - (Repair material cost/Item unit cost)
Source	PM(L)

Name	FMS(I)
Description	Maintenance site construction/preparation costs during Investment period in year I.
Dimension	$/year
Source	PMO

Name	FOS(I)
Description	Operational site construction/preparation costs during Investment period in year I.
Dimension	$/year
Source	PMO

Name	FPST
Description	Procurement lead and safety level stockage time for initial spare & repair parts.
Dimension	Days
Source	PM(L)

Name	FR(I)
Description	Reliability improvement or degradation factor during year I.
Dimension	Dimensionless
Source	PM(L)

Name	IRCON(I)
Description	Annual inflation rate for future costs for construction type of funding during year I.
Dimension	Ratio
Source	Analyst

Name	IROM(I)
Description	Annual inflation rate for future costs of O&M type of funding during year I.
Dimension	Ratio
Source	Analyst

Name	IRPROC(I)
Description	Annual inflation rate for future costs of procurement type of funding during year I.
Dimension	Ratio
Source	Analyst

Name	IRRD(I)
Description	Annual inflation rate for future costs of R&D type of funding during year I.
Dimension	Ratio
Source	Analyst

Name	ISSD(I)
Description	Storage space required for the depot inventory during year I.
Dimension	sq.ft./year
Source	PM(L) & Contractor

Name	ISSI(I)
Description	Storage space required for the O/I inventory during year I.
Dimension	sq.ft./year
Source	PM(L) & Contractor

Name	IYI
Description	Year I during which initial cost occur.
Dimension	Dimensionless
Source	PMO

Name	LO(I)
Description	Desired manning level for operating personnel during year I.
Dimension	Personnel/year
Source	PM(L) & Contractor

Name	LM(I)
Description	Desired manning level for O/I level maintenance personnel during year I.
Dimension	Personnel/year
Source	PM(L) & Contractor

Name	LP(I)
Description	Desired manning level for depot level maintenance personnel during year I.
Dimension	Personnel/year
Source	PM(L) & Contractor

Name	LPM(N)
Description	Preventive maintenance labor time for the Nth type of maintenance action.
Dimension	hrs/action
Source	PM(L) & Contractor

Name	LSD(K)
Description	Depot maintenance labor time to repair the Kth item.
Dimension	hrs/item
Source	PM(L) & Contractor

Name	LSI(K)
Description	O/I maintenance labor time to repair the Kth item.
Dimension	hrs/item
Source	PM(L) & Contractor

Name	LSO(K)
Description	O/I maintenance labor time to remove, replace the Kth item.
Dimension	hrs/item
Source	PM(L) & Contractor

Name	MPM(N)
Description	Material cost for the Nth type of preventive maintenance action.
Dimension	$/action
Source	PM(L) & Contractor

Name	MSSD(I)
Description	Shop space required for depot maintenance during year I.
Dimension	sq.ft./year
Source	PM(L) & Contractor

Name	MSSI(I)
Description	Shop space required for O/I maintenance during year I.
Dimension	sq.ft./year
Source	PM(L) & Contractor

Name	N(I)
Description	Number of equipments in the Navy's inventory system at the end of year I.
Dimension	equip/year
Source	PM(L)

Name	NC(I)
Description	Number of copies of technical data to be distributed and inventoried during year I.
Dimension	copies/year
Source	PM(L)

Name	NK
Description	Total number of spare/repair items in the prime equipment.
Dimension	Dimensionless
Source	PM(L) & Contractor

Name	NM
Description	Number of preventive maintenance types of the prime equipment.
Dimension	Dimensionless
Source	PM(L) & Contractor

Name	NN(I)
Description	Prime equipment annual acceptance schedule. Number of equipments acquired during year I.
Dimension	equip/year
Source	PMO & PM(L)

Name	NOH(I)
Description	Prime equipment overhaul schedule. Number of equipments scheduled to be overhauled during year I.
Dimension	equip/year
Source	PMO & PM(L)

Name	NP
Description	Number of pages per technical manual maintained by Navy.
Dimension	pages/copy
Source	PM(L) & Contractor

Name	NPM(N)
Description	Time between inspections of the Nth type of preventive maintenance action.
Dimension	hrs/action
Source	PM(L) & Contractor

Name	NPO(I)
Description	Prime equipment phase out schedule. Number of equipments scheduled to be phased out during year I.
Dimension	equip/year
Source	PMO & PM(L)

Name	NSNP
Description	Total number of new National Stock Numbers (NSN) to be issued on the prime equipment
Dimension	NSN
Source	PM(L) & Contractor

Name	NSNS
Description	Total number of new National Stock Numbers (NSN) to be issued on the peculiar Support & Test equipments
Dimension	NSN
Source	PM(L) & Contractor

Name	OHL
Description	Prime equipment overhaul maintenance labor time.
Dimension	hrs/equip
Source	PM(L) & Contractor

Name	OHM
Description	Prime equipment overhaul maintenance material cost.
Dimension	$/equip
Source	PM(L) & Contractor

Name	OHT
Description	Prime equipment overhaul maintenance material shipping rate.
Dimension	$/equip
Source	PM(L) & Contractor

Name	OT
Description	Prime equipment annual operating time.
Dimension	hrs/equip/year
Source	PMO

Name	PMG(I)
Description	Government project management costs incurred during the Investment period in year I. This refers to the technical and administrative planning, organizing, directing, coordinating, controlling and approval actions designed to accomplish overall program objectives. Examples of these activities are configuration management, cost/schedule management, data management, contract management, value engineering, quality assurance, and integrated logistic management.
Dimension	$/year
Source	PMO

Name	PO
Description	Number of personnel required to operate a prime equipment.
Dimension	personnel/equip
Source	PM(L)

Name	PSOS
Description	Floor space required for the operation of a prime equipment.
Dimension	sq.ft./equip
Source	PM(L) & Contractor

Name	PSS(I)
Description	Production support and services cost incurred during the Investment period of the life cycle cost. These are the supportive costs incurred during the production of the prime equipment. These costs may include engineering, facilities, production tooling and testing equipment, quality assurance, overhead costs of general and administrative expenses and contract fee. (NOTE: All or a portion of these costs may be included in the prime equipment hardware acquisition cost. If so user should be carefull not to <u>double count</u> the cost).
Dimension	$/year
Source	PMO

Name	PTE(I)
Description	Production Test and Evaluation costs incurred during Investment period in year I. These costs refer to Production Acceptance Test (PATE) and Operation Acceptance Test (OTE). Production Acceptance Tests are conducted on production items produced early in the production run. They are designed to assure that production equipments conform to design specifications and performance requirements when manufactured in accordance with production specifications. Operational tests are conducted by user personnel under the conditions of the operational tactical environment. They are designed to determine the equipment operational effectiveness and validate organization doctrine, tactics, training requirements and logistic support.
Dimension	$/year
Source	PMO

Name	PTI(I)
Description	Number of instructors to receive initial training during year I.
Dimension	student/year
Source	PM(L)

Name	PTM(I)
Description	Number of O/I maintenance personnel to receive initial training during year I.
Dimension	student/year
Source	PM(L)

Name	PTO(I)
Description	Number of Operating personnel to receive initial training during year I.
Dimension	student/year
Source	PM(L)

Name	PTP(I)
Description	Number of depot maintenance personnel to receive initial training during year I.
Dimension	student/year
Source	PM(L)

Name	QTY(K)
Description	Number of quantities of Kth spare/repair item
Dimension	quantity/item
Source	PM(L)

Name	R(K)
Description	Mean Time Between Failures of the Kth spare/repair item.
Dimension	hrs/failure
Source	PM(L)

Name	RAM
Description	Operator and O/I level maintenance personnel attrition rate.
Dimension	ratio
Source	PM(L)

Name	RAP
Description	Depot level maintenance personnel attrition rate.
Dimension	ratio
Source	PM(L)

Name	RDM
Description	Technical data management costs for file maintenance.
Dimension	$/page/year
Source	PM(L)

Name	RIE
Description	Average National Stock Number (NSN) entry cost into the supply system.
Dimension	$/NSN
Source	PM(L)

Name	RIM
Description	Supply support management item retention and field administration cost.
Dimension	$/NSN
Source	PM(L)

Name	RO
Description	Prime equipment operator pay rate.
Dimension	$/hr/man
Source	PM(L)

Name	RPL
Description	Packaging labor cost.
Dimension	$/#
Source	PM(L)

Name	RPM
Description	Packaging material cost.
Dimension	$/#
Source	PM(L)

Name	RSD
Description	Depot maintenance personnel pay rate to repair failed items.
Dimension	$/hr/man
Source	PM(L)

Name	RSL
Description	O/I maintenance personnel pay rate to remove replace or repair failed items.
Dimension	$/hr/man
Source	PM(L)

Name	RSR
Description	Average shipping Cost.
Dimension	$/#
Source	PM(L)

Name	RSS(K)
Description	Fraction of failures repaired at the intermediate maintenance level. This value lies inclusively between "0" and "1". "0" refers to all depot repair and 1 refers to all intermediate depot repair.
Dimension	ratio
Source	PM(L) & Contractor

Name	RW(K)
Description	Ratio of the shipping weight to the unpacked weight of the Kth item.
Dimension	ratio
Source	PM(L) & Contractor

Name	STE(I)
Description	Support & Test equipment acquisition costs incurred during Investment period in year I. This refers to the Support & Test equipments required to maintain and care for the prime equipment while not directly engaged in the performance of its mission. This includes vehicles, equipment and tools used to service transport and hoist, repair, overhaul, assemble, disassemble, test, inspect or otherwise maintain the mission equipment. This also includes the software costs associated with the Support & Test equipment.
Dimension	$/year
Source	PMO

Name	STEM
Description	Support & Test equipment initial support rate. Percent of S&TE acquisition cost
Dimension	ratio
Source	PM(L)

Name	STES
Description	Support & Test equipment recurring support cost.
Dimension	$/Prime Equipment
Source	PM(L)

Name	W(K)
Description	Unpacked weight of the Kth spare/repair item.
Dimension	#/item
Source	PM(L) & Contractor

Name	TERM
Description	Termination cost and/or value of the prime equipment.
Dimension	$/equip
Source	PM(L)

Name	Y
Description	Total number of years covered by the life cycle cost analysis.
Dimension	dimensionless
Source	PMO

APPENDIX C

Inflation/Discounting Adjustment Factors

Inflation/Discounting Adjustment Factors

Life Cycle Cost Analysis is concerned with the evaluation of alternatives. These alternatives are described by indicating the timing of the future disbursements that will result from each procurement decision. Guidelines for adjusting future expenditures for the effects of time, cost of capital and inflation are found in SECNAVINST 7000.14B.

The LCC MODEL developed by the Naval Material Command adjusts all costs which occur during and after the BY (Base Year). The adjustment factors convert the future expenditures to current dollar value, which represents the general purchasing power of the dollar at the time of the decision, by the following method:

Future current dollar value is

$$\left(1 + IR \right)^{n}$$

Where

"IR" is the annual inflation rate

"n" is the number of years after the base point decision

The adjustment factor then converts this future current dollar expenditure into its present value dollar by the following method:

AD-A083 845 NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY WASHINGTON DC F/G 15/5
LIFE CYCLE COST GUIDE FOR EQUIPMENT ANALYSIS.(U)
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2 OF 2
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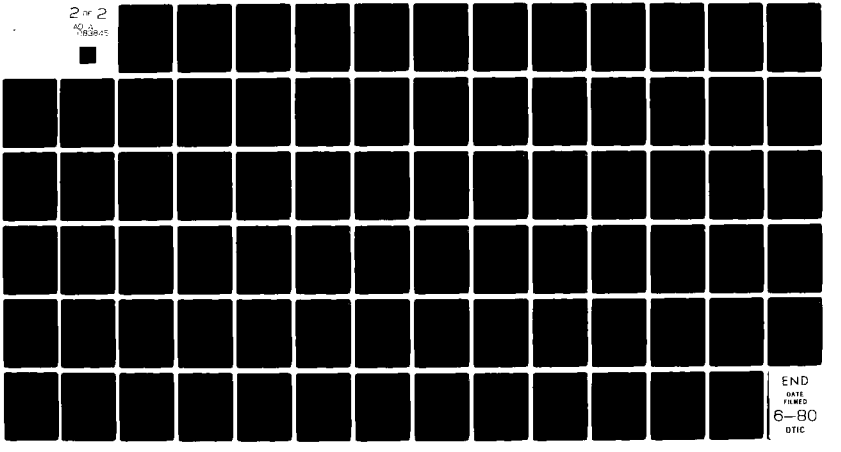


END
DATE FILMED
6-80
DTIC

Present value dollar is

$$\left\{ \frac{1}{1 + DR} \right\}^{n}$$

Where

"DR" is the annual discount rate

The present value dollar represents the amount of money the Government must put into an interest or profit generating account at the time of the decision to have the future current dollar available for an expenditure at the end of " n " years.

The above equations assume that the future expenditure occurs at the end of " n " years but the cost is usually incurred throughout the year. Therefore, in accordance with SECNAVINST 7000.14B, an aritmetic mean (average) adjustment factor equation has been developed for the LCC MODEL:

Annual adjustment factor is

$$\left\{ \left\{ \frac{1 + IR}{1 + DR} \right\}^{n-1} + \left\{ \frac{1 + IR}{1 + DR} \right\}^{n} \right\} \div 2$$

NAVMAT LCC Model uses four inflation adjustment factors and one discount adjustment factor subscripted by year.

APPENDIX D

NAVMAT Equipment LCC Model Sample Computer Run

NAVMAT EQUIPMENT LCC Model Sample Computer Run

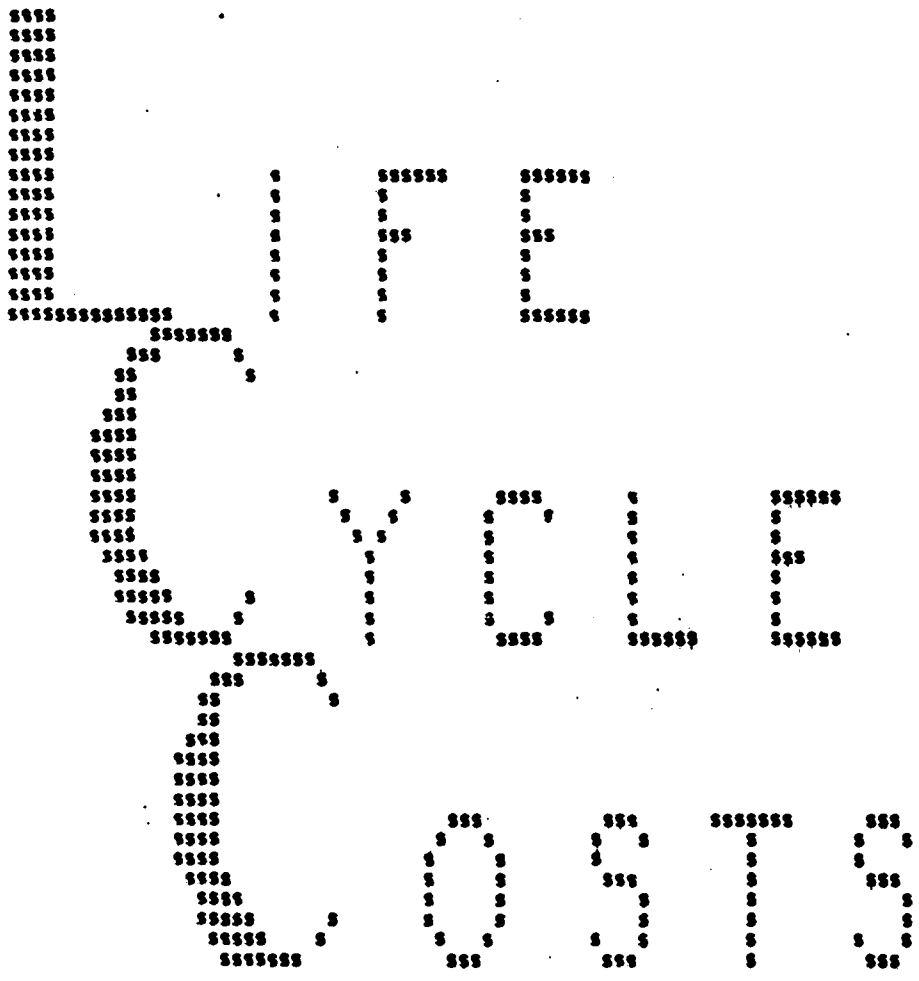
This Appendix contains an example of the types of Reports available from the LCC Computer program developed by the Naval Material Command.

The values used in this sample data should not be considered as reference for actual calculations.

All input and output reports are provided in constant dollars except the Summary Output Report which is provided in constant dollars, inflated dollars, and inflated and discounted dollars.

A sensitivity analysis is provided for both the Scalar and the Array type of variables.

DATE 11/ 1/76



(LCC FLEX)

ANALYSIS IDENTIFICATION:

SAMPLE COMPUTER RUN FOR NAVMAT EQUIPMENT LIFE CYCLE COST MODEL

INPUT DATA LISTING AND ERROR DIAGNOSTICS

```
CN1111117111111   0                                                          1
RM       THIS PROGRAM IS BASED ON COST ALGORITHMS PROVIDED BY THE            2
RM    NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY MANAGEMENT ENGINEERING      3
RM    DEPARTMENT COST MANAGEMENT DIVISION.                                   4
RM       DATA IS PROVIDED FOR SAMPLE PURPOSE ONLY AND SHOULD NOT BE USED     5
RM    AS A BASE FOR INTERPRETATION FOR ANY PROJECT.                          6
RM       QUESTIONS FOR INTERPRETATION OF INPUT DATA OR LCC PHILOSOPHY        7
RM    SHOULD BE DIRECTED TO                                                  8
RM             ALPUAN ATAY                                                  9
RM             NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY ESA-8431          10
RM             WASHINGTON NAVY YARD                                         11
RM             WASHINGTON, D.C.  20374                                      12
RM             PHONE  202-433-4084                                          13
 &INPUT                                                                     14
      BY=1.          CE=2.        CIPE=1500.       CM=.60.        CP=.05.   15
     CSD=2.4.       CSI=240.      CSO=240.       CTI=1000.      CTM=750.    16
     CTO=500.       CTP=1000.    CTPE=600.        CU=50000.    FDRT=117.    17
    FILS=90.       FIRT=3.        FM=.12.      FPST=411.       IYI=2.       18
      NP=200.      NSNP=75.     NSNS=357.       OHL=120.      OHM=1500.     19
     OHT=500.       OT=1600.      PO=1.        POS=50.        RAM=.40.     20
     RAP=.13.       RDM=100.     RIE=100.       RIM=100.       RO=7.87.     21
     RPL=1.0.       RPM=.5.      RSD=17.22.     RSL=7.87.     RSR=.184.     22
    STEM=.25.      STES=5000.    TERM=1200.                                  23
      NM=2.                                                                 24
 NPM=100,600.                                                               25
 LPM=8.15.                                                                  26
 MPM=50,150.                                                                27
      NK=15.                                                                28
 CST=750,1200,5000,4200,1700,2*3500,9000,4*500,2*2500,6000.                 29
 DC=4*.75,1,3*.75,7*1.                                                      30
 DSC=1,.2,2*.1,8,.1,8,8*.1.                                                 31
 LSD=8.7,18.6.8,9,6.20.4*5,10,5,15.                                         32
 LSI=8.5,12,4.8,6,5,15,4*3,7.3,11.                                          33
 LSO=3,2,1.8,2.6,4,2*3,4,4*2,4,1,3.                                         34
 QTY=2,4,1,3,6,1,2,1,4*2,3*1.                                               35
 R=750,500,470,600,250,400,600,900,4*350,700,1200,1500.                     36
 RSS=1,.6,.7,.5,1,.8,.6,.9,4*.85,.8,.7,.4.                                  37
 PW=15*1.25.                                                                38
 W=75,100,170,300,250,190,300,50,600,450,275,310,140,260,700.               39
      Y=5.                                                                  40
 AD=300000,4*0.                                                             41
 ADC=500000,4*0.                                                            42
 ADG=250000,4*0.                                                            43
 ATU=50000,4*0.                                                             44
 CS=2*0.3*15000.                                                            45
 DCD=150000,4*0.                                                            46
 DCE=A00000,4*0.                                                            47
 DCH=600000,4*0.                                                            48
```

INPUT DATA LISTING AND ERROR DIAGNOSTICS

```
 DCPM=200000,4*0,                                                          49
 DCS=150000,4*0,                                                           50
 DCST=350000,4*0,                                                          51
 DCTE=75000,4*0,                                                           52
 DGPM=550000,4*0,                                                          53
 DGTA=50000,4*0,                                                           54
 DGTE=275000,4*0,                                                          55
 DGTT=10000,4*0,                                                           56
 FMS=0,400000,200000,2*0,                                                  57
 FOS=0,150000,75000,2*0,                                                   58
 FR=3*1,,9,,75,                                                            59
 ISSD=0,4*250,                                                             60
 ISSI=0,4*1000,                                                            61
 LO=2*0,80,2*100,                                                          62
 MSSD=0,4*150,                                                             63
 MSSI=0,4*1000,                                                            64
 NC=0,25,3*0,                                                              65
 NOH=4*0,80,                                                               66
 NPO=4*0,15,                                                               67
 PMG=0,650000,270000,2*0,                                                  68
 PSS=0,350000,3*0,                                                         69
 PTE=0,50000,3*0,                                                          70
 PTI=0,15,3*0,                                                             71
 PTM=0,50,30,20,0,                                                         72
 PTO=0,50,30,20,0,                                                         73
 PTP=0,10,3*0,                                                             74
 STE=500000,4*0,                                                           75
 N=2*0,80,2*100,                                                           76
 NN=0,50,30,20,0,                                                          77
 LM=2*0,80,2*100,                                                          78
 LP=2*0,3*10,                                                              79
    IRAD=5*,055, IRPROC=5*,07,  IRCON=5*,06,   IROH=5*,05,    DR=5*,10,    80
 &END                                                                      81
SA      CU      25000.    75000.                                          82
SA      R       .5        1.5                                             83
```

INPUT DATA LISTING AND ERROR DIAGNOSTICS

*** INPUT STATISTICS ***
83 CARDS READ
0 ERRORS
STATISTICS 0 NEW SCALARS 0 NEW ARRAYS 0 NEW ARRAY ELEMENTS

EQUATIONS

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	EQUATION						
000000	TOTAL LIFE CYCLE							
100000	RESEARCH AND DEVELOPMENT							
110000	VALIDATION							
111000	CONTRACTOR							
		ADC	I		I	Y		
112000	GOVERNMENT							
		ADG	I		I	Y		
120000	FULL SCALE DEVELOPMENT							
121000	CONTRACTOR							
121100	MANAGEMENT							
		DCPM	I		I	Y		
121200	ENGINEERING							
		DCE	I		I	Y		
121300	PROTOTYPE HARDWARE							
		DCH	I		I	Y		
121400	SOFTWARE							
		DCS	I		I	Y		
121500	TEST & EVALUATION							
		DCTE	I		I	Y		
121600	DOCUMENTATION							
		DCD	I		I	Y		
121700	SUPPORT & TEST EQUIPMENT							
		DCST	I		I	Y		
122000	GOVERNMENT							
122100	PROGRAM MANAGEMENT							
		DGPM	I		I	Y		
122200	PROTOTYPE TEST & EVALUATION							
122210	TRAINING							
		DGTT	I		I	Y		
122220	TEST SITE ACTIVATION							
		DGTA	I		I	Y		
122230	TEST & EVALUATION							
		DGTE	I		I	Y		
200000	INVESTMENT							
210000	GOVERNMENT PROGRAM MANAGEMENT							
		PMG	I		I	Y		
220000	PRIME EQUIPMENT ACQUISITION							
221000	PRODUCTION HARDWARE							
		NN	I	CU	*	I	1	Y
222000	PRODUCTION SUPPORT & SERVICES							
		PSS	I		I	Y		
223000	PRODUCTION TEST & EVALUATION							
		PTE	I		I	Y		
224000	TRANSPORTATION							
		NN	I	CTPE	*	I	1	Y

EQUATIONS

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	EQUATION
225000	INSTALLATION & CHECKOUT	NN I CIPE * I I 1 Y
230000	INITIAL SUPPORT ACQUISITION	
231000	SUPPORT & TEST EQUIPMENT ACQUISITION	STE I I I 1 Y
232000	SUPPLY SUPPORT	
232100	INITIAL SPARES	
232110	PRIME EQUIPMENT	NN I QT * DC K * QTY K *
		CST K * DSC K FPST FILS + * RSS
		K FIRT * FORT 1 RSS K - 9 +
		1 DSC K - * + * R K FR
		I 365 * * / I I 1 Y K
		1 NK
232120	SUPPORT & TEST EQUIPMENT	STE I STEM * I I 1 Y
232200	NSN ENTRY INTO THE SUPPLY SYSTEM	NSNP NSNS + RIE * I I IYI IYI
233000	FACILITIES	
233100	OPERATIONAL	FOS I I I 1 Y
233200	MAINTENANCE	FMS I I I 1 Y
234000	DOCUMENTATION	
234100	ACQUISITION	AD I I I 1 Y
234200	REPRODUCTION AND DISTRIBUTION	NC I NP * CP * I I 1 Y
235000	TRAINING	
235100	OPERATOR	PTO I CTO * I I 1 Y
235200	O/I LEVEL MAINTENANCE	PTM I CTM * I I 1 Y
235300	DEPOT LEVEL MAINTENANCE	PTP I CTP * I I 1 Y
235400	INSTRUCTOR	PTI I CTI * I I 1 Y
235500	TRAINING AIDS	ATU I I I 1 Y
300000	OPERATING AND SUPPORT	
310000	OPERATION	
311000	PERSONNEL	N I PO * RO * QT * I I
		1 Y
312000	FACILITIES	N I PSOS * CSO * I I 1 Y

DATE 11/ 1/76

SAMPLE COMPUTER RUN FOR NAVMAT EQUIPMENT LIFE CYCLE COST MODEL

EQUATIONS

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	EQUATION									
313000	ENERGY CONSUMPTION										
314000	MATERIAL CONSUMPTION	N	I	CE	*	OT	*	(	I	)	Y
315000	SOFTWARE MAINTENANCE	N	I	CM	*	OT	*	(	I	)	Y
320000	SUPPORT	CS	I	|	I	1	Y				
321000	CORRECTIVE MAINTENANCE										
321100	LABOR										
321110	O/I LEVEL (REMOVE & REPLACE)										
321120	O/I LEVEL (REPAIR)	N LSO /	I K |	OT * I	* RSL 1	DC * Y	K R K	* K 1	QTY FR NK	K I	* *
321130	DEPOT LEVEL (REPAIR)	N LSI K I	I K - 1	OT * * Y	* RSL R K	DC * K 1	K RSS FR NK	* K I	QTY * *	K 1 /	* DSC |
321200	REPAIR MATERIAL	N LSD 1 /	I K DSC |	OT * K I	* RSD - I	DC * * Y	K 1 R K	* RSS K 1	QTY K FR NK	K - I	* * *
321300 321310	TRANSPORTATION AND PACKAGING MATERIAL HANDLING LABOR	N CST R K	I K K 1	OT * FR NK	* FM I	DC * *	K 1 /	* DSC |	QTY K I	K - 1	* * Y
321320	PACKAGING MATERIAL	N 2 - I	I * * *	OT W 1 /	* K DSC |	DC * K I	K RPL - 1	* * * Y	QTY 1 R K	K RSS K 1	* K FR NK
321330	SHIPPING	N 2 - 1	I * * *	OT W 1 /	* K DSC 1	DC * K I	K RPH - 1	* * * Y	QTY 1 R K	K RSS. K 1	* K FR NK
322000	PREVENTIVE MAINTENANCE	N 2 1 R K	I * RSS K 1	OT W K FR NK	* K - I	DC * * *	K RSR 1 /	* * DSC |	QTY RW K I	K K - 1	* * * Y

EQUATIONS

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	EQUATION									
322100	LABOR	N	I	OT	*	LPM	N	*	RSL	*	NPM
		N	/	I	I	1	Y	N	1	NM	
322200	MATERIAL	N	I	OT	*	MPM	N	*	NPM	N	/
		I	I	1	Y	N	1	NM			
323000	OVERHAUL										
323100	LABOR	NOH	I	OHL	*	RSD	*	I	I	1	Y
323200	MATERIAL	NOH	I	OHM	*	I	I	1	Y		
323300	TRANSPORTATION	NOH	I	OHT	*	I	I	1	Y		
324000	SUPPORT & TEST EQUIPMENT MAINTENANCE	N	I	STES	*	I	I	1	Y		
325000	FACILITIES										
325100	SHOP SPACE										
325110	O/I LEVEL	MSSI	I	CSI	*	I	I	1	Y		
325120	DEPOT LEVEL	MSSD	I	CSD	*	I	I	1	Y		
325200	INVENTORY STORAGE										
325210	O/I LEVEL	ISSI	I	CSI	*	I	I	1	Y		
325220	DEPOT LEVEL	ISSD	I	CSD	*	I	I	1	Y		
326000	DOCUMENTATION MAINTENANCE	NP	RDM	*	I	I	IYI	Y			
327000	SUPPLY SUPPORT										
327100	REPLENISHMENT SPARES	N	I	OT	*	OC	K	*	QTY	K	*
		CST	K	*	OSC	K	*	R	K	FR	I
		*	/	I	I	1	Y	K	1	NK	
327200	SUPPLY SYSTEM MANAGEMENT	NSNP	NSNS	*	RIM	*	I	I	IYI	Y	
328000	TRAINING										
328100	OPERATOR	LO	I	RAM	*	CTO	*	I	I	1	Y
328200	O/I LEVEL MAINTENANCE	LM	I	RAM	*	CTM	*	I	I	1	Y
328300	DEPOT LEVEL MAINTENANCE	LP	I	RAP	*	CTP	*	I	I	1	Y
330000	TERMINATION	NPO	I	TERM	*	I	I	1	Y		

REMARKS

THIS PROGRAM IS BASED ON COST ALGORITHIMS PROVIDED BY THE NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY MANAGEMENT ENGINEERING DEPARTMENT COST MANAGEMENT DIVISION.

DATA IS PROVIDED FOR SAMPLE PURPOSE ONLY AND SHOULD NOT BE USED AS A BASE FOR INTERPRETATION FOR ANY PROJECT.

QUESTIONS FOR INTERPRETATION OF INPUT DATA OR LCC PHILOSOPHY SHOULD BE DIRECTED TO

ALPUAN ATAY
NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY ESA-8431
WASHINGTON NAVY YARD
WASHINGTON, D.C. 20374
PHONE 202-433-4084

NAMES, DESCRIPTIONS, AND DIMENSIONS OF BUILT-IN VARIABLES

AD(I)	ACQUISITION COST OF DATA DURING INVESTMENT PERIOD ($/YEAR)
ADC(I)	GOVERNMENT PAYMENTS TO THE CONTRACTOR FOR TECHNICAL AND MNAGERIAL WORK PERFORMED DURING VALIDATION PHASE ($/YEAR)
ADG(I)	GOVERNMENT EXPENDITURES FOR TECHNICAL AND MANAGERIAL WORK PERFORMED DURING VALIDATION PHASE ($/YEAR)
ATU(I)	ACQUISITION, TRANSPORTATION, AND INSTALLATION COSTS OF TRAINING AIDS AND DEVICES DURING INITIAL TRAINING ($/YEAR)
BY	BASE YEAR DURING/FROM WHICH ALL COST ADJUSTMENTS ARE MADE (DIMENSIONLESS)
CE	ENERGY CONSUMPTION COST INCURRED DURING THE OPERATION OF THE PRIME EQUIPMENT ($/HR/EQUIP.)
CIPE	INSTALLATION COST OF THE PRIME EQUIPMENT ($/EQUIP.)
CM	COST OF MATERIALS CONSUMED DURING THE OPERATION OF THE PRIME EQUIPMENT ($/HR/EQUIP.)
CP	AVERAGE COST PER PAGE OF SET-UP, REPRODUCTION AND DISTRIBUTION OF TECHNICAL MANUALS ($/PAGE/COPY)
CS(I)	SOFTWARE MAINTENANCE COST DURING PRIME EQUIPMENT OPERATION ($/YEAR)
CSD	AREA COST FOR DEPOT LEVEL MAINTENANCE ($/SQ. FT./YEAR)
CSI	AREA COST FOR O/I LEVEL MAINTENANCE SPACE ($/SQ. FT./YEAR)
CSO	AREA COST FOR OPERATIONAL SPACE ($/SQ. FT./YEAR)
CST(K)	UNIT COST OF THE KTH SPARE/REPAIR ITEM ($/ITEM)
CTI	AVERAGE INSTRUCTOR TRAINING COST FOR PERSONNEL PAY & ALLOWANCE TRAVEL AND COURSE FEES ($/STUDENT)
CTM	AVERAGE O/I MAINTENANCE PERSONNEL TRAINING COST FOR PAY & ALLOWANCE, TRAVEL AND COURSE FEES ($/STUDENT)
CTO	AVERAGE OPERATING PERSONNEL TRAINING COSTS FOR PAY & ALLOWANCE, TRAVEL AND COURSE FEES ($/STUDENT)
CTP	AVERAGE DEPOT MAINTENANCE PERSONNEL TRAINING COSTS FOR PAY & ALLOWANCE, TRAVEL AND COURSE FEES ($/STUDENT)
CTPE	TRANSPORTATION COST OF PRIME EQUIPMENT FROM CONTRACTORS FACILITY TO INSTALLATION SITE ($/EQUIP.)
CU	UNIT PRICE OF ONE OF THE CONTRACTORS EQUIPMENT ($/EQUIPMENT)
DC(K)	DUTY CYCLE OF THE KTH SPARE/REPAIR ITEM (RATIO)
DCD(I)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR FOR ALL THE DATA ACQUIRED DURING FULL SCALE DEVELOPMENT ($/YEAR)
DCE(I)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR FOR THE ENGINEERING EFFORTS DURING FULL SCALE DEVELOPMENT ($/YEAR)
DCH(I)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR HARDWARE DEVELOPMENT EFFORTS DURING FULL SCALE DEVELOPMENT ($/YEAR)
DCPM(I)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR MANAGEMENT EFFORTS DURING FULL SCALE DEVELOPMENT ($/YEAR)
DCS(I)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR SOFTWARE DEVELOPMENT EFFORT DURING FULL SCALE DEVELOPMENT ($/YEAR)
DCST(I)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR S&TE DEVELOPMENT EFFORT DURING FULL SCALE DEVELOPMENT ($/YEAR)
DCTE(I)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR TEST&EVALUATION EFFORTS DURING FULL SCALE DEVELOPMENT ($/YEAR)
DGPM(I)	GOVERNMENT PROJECT MANAGEMENT COSTS INCURRED DURING FULL SCALE DEVELOPMENT ($/YEAR)
DGTA(I)	GOVERNMENT COSTS FOR TEST SITE ACTIVATION/DEACTIVATION DURING FULL SCALE DEVELOPMENT T&E PROGRAM ($/YEAR)
DGTE(I)	GOVERNMENT PERSONNEL COSTS INCURRED DURING FULL SCALE DEVELOPMENT T&E PROGRAM FOR TESTING & EVALUATION ($/YEAR)
DGTT(I)	GOVERNMENT COST TO TRAIN STUDENTS DURING FULL SCALE DEVELOPMENT TEST & EVALUATION PROGRAM ($/YEAR)
DR(I)	ANNUAL DISCOUNT RATE FOR FUTURE COSTS (RATIO)
DSC(K)	DISCARD RATE OF THE KTH ITEM (RATIO)
FDRT	REQUIRED STOCKAGE TIME FOR DEPOT LEVEL REPAIRABLE ITEMS AT O/I AND DEPOT LEVEL (DAYS)
FILS	REQUIRED STOCKAGE TIME FOR REPLENISHMENT SPARES AT O/I LEVEL (DAYS)
FIRT	REPAIR CYCLE TIME OF REPAIRABLE ITEMS AT O/I LEVEL (DAYS)
FM	REPAIR MATERIAL RATE (RATIO)
FMS(I)	MAINTENANCE SITE CONSTRUCTION/PREPARATION COSTS DURING INVESTMENT PERIOD ($/YEAR)
FOS(I)	OPERATIONAL SITE CONSTRUCTION/PREPARATION COSTS DURING INVESTMENT PERIOD ($/YEAR)
FPST	PROCUREMENT LEAD AND SAFETY LEVEL STOCKAGE TIME FOR INITIAL SPARE AND REPAIR PARTS (DAYS)
FR(I)	RELIABILITY IMPROVEMENT OR DEGRIDATION FACTOR (DIMENSIONLESS)
INCON(I)	ANNUAL INFLATION RATE FOR FUTURE COSTS FOR CONSTRUCTION TYPE OF FUNDING (RATIO)
IPOM(I)	ANNUAL INFLATION RATE FOR FUTURE COSTS OF O&M TYPE OF FUNDING (RATIO)
IPPROC(I)	ANNUAL INFLATION RATE FOR FUTURE COSTS OF PROCUREMENT TYPE OF FUNDING (RATIO)
IRRD(I)	ANNUAL INFLATION RATE FOR FUTURE COSTS OF R&D TYPE OF FUNDING (RATIO)
ISSD(I)	STORAGE SPACE REQUIRED FOR THE DEPOT INVENTORY (SQ. FT./YEAR)
ISSI(I)	STORAGE SPACE REQUIRED FOR THE O/I INVENTORY (SQ. FT./YEAR)
IYI	YEAR DURING WHICH INITIAL COST OCCUR (DIMENSIONLESS)
LO(I)	DESIRED MANNING LEVEL FOR OPERATING PERSONNEL (PERSONNEL/YEAR)
LM(I)	DESIRED MANNING LEVEL FOR O/I LEVEL MAINTENANCE PERSONNEL (PERSONNEL/YEAR)
LP(I)	DESIRED MANNING LEVEL FOR DEPOT LEVEL MAINTENANCE PERSONNEL (PERSONNEL/YEAR)

NAMES, DESCRIPTIONS, AND DIMENSIONS OF BUILT-IN VARIABLES

LPM(N)	PREVENTIVE MAINTENANCE LABOR TIME FOR NTH MAINTENANCE ACTION (HR/ACTION)
LSD(K)	DEPOT MAINTENANCE LABOR TIME TO REPAIR THE KTH ITEM (HR/ITEM)
LSI(K)	O/I LEVEL MAINTENANCE LABOR TIME TO REPAIR THE KTH ITEM (HR/ITEM)
LSO(K)	O/I LEVEL MAINTENANCE LABOR TIME TO REMOVE AND REPLACE THE KTH ITEM (HR/ITEM)
MPM(N)	MATERIAL COST FOR NTH TYPE OF PREVENTIVE MAINTENANCE ACTION ($/ACTION)
MSSD(I)	SHOP SPACE REQUIRED FOR DEPOT LEVEL MAINTENANCE (SQ. FT./YEAR)
MSSI(I)	SHOP SPACE REQUIRED FOR O/I LEVEL MAINTENANCE (SQ. FT./YEAR)
N(I)	NUMBER OF EQUIPMENTS IN THE NAVY'S INVENTORY SYSTEM (EQUIP./YEAR)
NC(I)	NUMBER OF COPIES OF TECHNICAL DATA TO BE DISTRIBUTED AND INVENTORIED (COPIES/YEAR)
NK	TOTAL NUMBER OF SPARE/REPAIR ITEMS IN THE PRIME EQUIPMENT (DIMENSIONLESS)
NM	TOTAL NUMBER OF PREVENTIVE MAINTENANCE TYPES OF THE PRIME EQUIPMENT (DIMENSIONLESS)
NP(I)	PRIME EQUIPMENT ANNUAL ACCEPTANCE SCHEDULE (EQUIP./YEAR)
NOH(I)	PRIME EQUIPMENT OVERHAUL SCHEDULE (EQUIP./YEAR)
NP	NUMBER OF PAGES PER TECHNICAL MANUAL MAINTAINED BY NAVY (PAGES/COPY)
NPM(N)	TIME BETWEEN INSPECTIONS OF THE PREVENTIVE MAINTENANCE ACTIONS (HR/ACTION)
NPO(I)	PRIME EQUIPMENT PHASE OUT SCHEDULE (EQUIP./YEAR)
NSNP	TOTAL NUMBER OF NEW NATIONAL STOCK NUMBERS TO BE ISSUED ON THE PRIME EQUIPMENT (NSN)
NSNS	TOTAL NUMBER OF NEW NATIONAL STOCK NUMBERS TO BE ISSUED ON THE PECULIAR S&TE EQUIPMENTS (NSN)
OHL	PRIME EQUIPMENT OVERHAUL MAINTENANCE LABOR TIME (HR/EQUIP.)
OHM	PRIME EQUIPMENT OVERHAUL MAINTENANCE MATERIAL COST ($/EQUIP.)
OHT	PRIME EQUIPMENT OVERHAUL MAINTENANCE MATERIAL SHIPPING RATE ($/EQUIP.)
OT	PRIME EQUIPMENT ANNUAL OPERATING TIME (HR/YEAR)
PMG(I)	GOVERNMENT PROJECT MANAGEMENT COSTS INCURRED DURING INVESTMENT PERIOD ($/YEAR)
PO	NUMBER OF PERSONNEL REQUIRED TO OPERATE A PRIME EQUIPMENT (PERSONNEL/EQUIP.)
PSOS	FLOOR SPACE REQUIRED FOR THE OPERATION OF A PRIME EQUIPMENT (SQ. FT./EQUIP.)
PSS(I)	PRODUCTION SUPPORT & SERVICES COST INCURRED DURING THE INVESTMENT PERIOD ($/YEAR)
PTE(I)	PRODUCTION TEST & EVALUATION COSTS INCURRED DURING THE INVESTMENT PERIOD ($/YEAR)
PTI(I)	NUMBER OF INSTRUCTORS TO RECEIVE INITIAL TRAINING (STUDENT/YEAR)
PTM(I)	NUMBER OF O/I MAINTENANCE PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR)
PTO(I)	NUMBER OF OPERATING PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR)
PTP(I)	NUMBER OF DEPOT MAINTENANCE PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR)
QTY(K)	NUMBER OF QUANTITIES OF A SPARE/REPAIR ITEM (QUANTITY/ITEM)
R(K)	MEAN TIME BETWEEN FAILURES OF THE SPARE/REPAIR ITEM (HR/ITEM)
RAM	OPERATOR AND O/I LEVEL MAINTENANCE PERSONNEL ATTRITION RATE (RATIO)
RAP	DEPOT LEVEL MAINTENANCE PERSONNEL ATTRITION RATE (RATIO)
RDM	TECHNICAL DATA MANAGEMENT COST FOR FILE MAINTENANCE ($/PAGE/YEAR)
RIF	AVERAGE NATIONAL STOCK NUMBER (NSN) ENTRY COST INTO THE SUPPLY SYSTEM ($/NSN)
RIM	SUPPLY SUPPORT MANAGEMENT ITEM RETENTION AND FIELD ADMINISTRATION COST ($/NSN)
RO	PRIME EQUIPMENT OPERATOR HOURLY PAY RATE ($/HR/OPERATOR)
RPL	PACKAGING LABOR COST ($/LB.)
RPM	PACKAGING MATERIAL COST ($/LB.)
RSD	DEPOT MAINTENANCE PERSONNEL PAY RATE TO REPAIR FAILED ITEMS ($/HR/MAN)
RSL	O/I MAINTENANCE PERSONNEL PAY RATE TO REMOVE, REPLACE OR REPAIR FAILED ITEMS ($/HR/MAN)
RSR	AVERAGE SHIPPING COST ($/LB.)
RSS(K)	FRACTION OF FAILURES REPAIRED AT THE INTERMEDIATE MAINTENANCE LEVEL FOR THE KTH ITEM (RATIO)
R4(K)	RATIO OF THE SHIPPING WEIGHT TO THE UNPACKED WEIGHT OF THE KTH ITEM (RATIO)
STE(I)	SUPPORT & TEST EQUIPMENT ACQUISITION COST ($/YEAR)
STEM	SUPPORT & TEST EQUIPMENT INITIAL SUPPORT RATE, PERCENT OF S&TE ACQUISITION COST (RATIO)
STES	SUPPORT & TEST EQUIPMENT RECURRING SUPPORT COST PER PRIMEEQUIPMENT ($/EQUIP.)
TERM	TERMINATION COST AND/OR VALUE OF THE PRIME EQUIPMENT ($/EQUIP.)
W(K)	UNPACKED WEIGHT OF THE KTH ITEM (LB./ITEM)
Y	NUMBER OF YEARS COVERED BY THE LIFE CYCLE ANALYSIS (DIMENSIONLESS)

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME	DESCRIPTION
AD (5)	ACQUISITION COST OF DATA DURING INVESTMENT PERIOD ($/YEAR)
300,000.00	0.00 0.00 0.00 0.00
ADC (5)	GOVERNMENT PAYMENTS TO THE CONTRACTOR FOR TECHNICAL AND MNAGERIAL WORK PERFORMED DURING VALIDATION PHASE ($/YEAR)
500,000.00	0.00 0.00 0.00 0.00
ADG (5)	GOVERNMENT EXPENDITURES FOR TECHNICAL AND MANAGERIAL WORK PERFORMED DURING VALIDATION PHASE ($/YEAR)
250,000.00	0.00 0.00 0.00 0.00
ATU (5)	ACQUISITION, TRANSPORTATION, AND INSTALLATION COSTS OF TRAINING AIDS AND DEVICES DURING INITIAL TRAINING ($/YEAR)
50,000.00	0.00 0.00 0.00 0.00
BY	BASE YEAR DURING/FROM WHICH ALL COST ADJUSTMENTS ARE MADE (DIMENSIONLESS)
1.00	
CF	ENERGY CONSUMPTION COST INCURRED DURING THE OPERATION OF THE PRIME EQUIPMENT ($/HR/EQUIP.)
2.00	
CIPE	INSTALLATION COST OF THE PRIME EQUIPMENT ($/EQUIP.)
1,500.00	
CM	COST OF MATERIALS CONSUMED DURING THE OPERATION OF THE PRIME EQUIPMENT ($/HR/EQUIP.)
0.50	
CP	AVERAGE COST PER PAGE OF SET-UP, REPRODUCTION AND DISTRIBUTION OF TECHNICAL MANUALS ($/PAGE/COPY)
0.05	
CS (5)	SOFTWARE MAINTENANCE COST DURING PRIME EQUIPMENT OPERATION ($/YEAR)
0.00	0.00 15,000.00 15,000.00 15,000.00
CSD	AREA COST FOR DEPOT LEVEL MAINTENANCE ($/SQ. FT./YEAR)
2.40	
CSI	AREA COST FOR O/I LEVEL MAINTENANCE SPACE ($/SQ. FT./YEAR)
240.00	
CSO	AREA COST FOR OPERATIONAL SPACE ($/SQ. FT./YEAR)
240.00	
CST (15)	UNIT COST OF THE KTH SPARE/REPAIR ITEM ($/ITEM)
750.00	1,200.00 5,000.00 4,200.00 1,700.00 3,500.00 3,500.00 9,000.00 500.00 500.00
500.00	500.00 2,500.00 2,500.00 6,000.00
CTI	AVERAGE INSTRUCTOR TRAINING COST FOR PERSONNEL PAY & ALLOWANCE TRAVEL AND COURSE FEES ($/STUDENT)
1,000.00	

* READ ARRAY VALUES FROM LEFT TO RIGHT *

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME	DESCRIPTION
CTM 750.00	AVERAGE O/I MAINTENANCE PERSONNEL TRAINING COST FOR PAY & ALLOWANCE, TRAVEL AND COURSE FEES ($/STUDENT)
CTO 500.00	AVERAGE OPERATING PERSONNEL TRAINING COSTS FOR PAY & ALLOWANCE, TRAVEL AND COURSE FEES ($/STUDENT)
CTP 1,000.00	AVERAGE DEPOT MAINTENANCE PERSONNEL TRAINING COSTS FOR PAY & ALLOWANCE, TRAVEL AND COURSE FEES ($/STUDENT)
CTPE 600.00	TRANSPORTATION COST OF PRIME EQUIPMENT FROM CONTRACTORS FACILITY TO INSTALLATION SITE ($/EQUIP.)
CU 50,000.00	UNIT PRICE OF ONE OF THE CONTRACTORS EQUIPMENT ($/EQUIPMENT)
DC (15)	DUTY CYCLE OF THE KTH SPARE/REPAIR ITEM (RATIO)
0.75	0.75 0.75 0.75 1.00 0.75 0.75 0.75 1.00 1.00
1.00	1.00 1.00 1.00 1.00
DCD (5)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR FOR ALL THE DATA ACQUIRED DURING FULL SCALE DEVELOPMENT ($/YEAR)
150,000.00	0.00 0.00 0.00 0.00
DCE (5)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR FOR THE ENGINEERING EFFORTS DURING FULL SCALE DEVELOPMENT ($/YEAR)
800,000.00	0.00 0.00 0.00 0.00
DCH (5)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR HARDWARE DEVELOPMENT EFFORTS DURING FULL SCALE DEVELOPMENT ($/YEAR)
600,000.00	0.00 0.00 0.00 0.00
DCPM (5)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR MANAGEMENT EFFORTS DURING FULL SCALE DEVELOPMENT ($/YEAR)
200,000.00	0.00 0.00 0.00 0.00
DCS (5)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR SOFTWARE DEVELOPMENT EFFORT DURING FULL SCALE DEVELOPMENT ($/YEAR)
150,000.00	0.00 0.00 0.00 0.00
DCST (5)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR S&TE DEVELOPMENT EFFORT DURING FULL SCALE DEVELOPMENT ($/YEAR)
350,000.00	0.00 0.00 0.00 0.00
DCTF (5)	PAYMENT BY THE GOVERNMENT TO THE CONTRACTOR TEST&EVALUATION EFFORTS DURING FULL SCALE DEVELOPMENT ($/YEAR)
75,000.00	0.00 0.00 0.00 0.00
DGPM (5)	GOVERNMENT PROJECT MANAGEMENT COSTS INCURRED DURING FULL SCALE DEVELOPMENT ($/YEAR)
550,000.00	0.00 0.00 0.00 0.00
DGTA (5)	GOVERNMENT COSTS FOR TEST SITE ACTIVATION/DEACTIVATION DURING FULL SCALE DEVELOPMENT T&E PROGRAM ($/YEAR)
50,000.00	0.00 0.00 0.00 0.00

* READ ARRAY VALUES FROM LEFT TO RIGHT *

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME		DESCRIPTION								
DATE	(5)	GOVERNMENT PERSONNEL COSTS INCURRED DURING FULL SCALE DEVELOPMENT T&E PROGRAM FOR TESTING & EVALUATION ($/YEAR)								
	275,000.00	0.00	0.00	0.00	0.00					
DSTT	(5)	GOVERNMENT COST TO TRAIN STUDENTS DURING FULL SCALE DEVFLOPMENT TEST & EVALUATION PROGRAM ($/YEAR)								
	10,000.00	0.00	0.00	0.00	0.00					
DR	(5)	ANNUAL DISCOUNT RATE FOR FUTURE COSTS (RATIO)								
	0.10	0.10	0.10	0.10	0.10					
DSC	(15)	DISCARD RATE OF THE KTH ITEM (RATIO)								
	1.00	0.20	0.10	0.10	0.00	0.10	0.00	0.10	0.10	0.10
	0.10	0.10	0.10	0.10	0.10					
FDRT		REQUIRED STOCKAGE TIME FOR DEPOT LEVEL REPAIRABLE ITEMS AT O/I AND DEPOT LEVEL (DAYS)								
	117.00									
FILS		REQUIRED STOCKAGE TIME FOR REPLENISHMENT SPARES AT O/I LEVEL (DAYS)								
	90.00									
FIRT		REPAIR CYCLE TIME OF REPAIRABLE ITEMS AT O/I LEVEL (DAYS)								
	3.00									
FM		REPAIR MATERIAL RATE (RATIO)								
	0.12									
FMS	(5)	MAINTENANCE SITE CONSTRUCTION/PREPARATION COSTS DURING INVESTMENT PERIOD ($/YEAR)								
	0.00	400,000.00	200,000.00	0.00	0.00					
FOS	(5)	OPERATIONAL SITE CONSTRUCTION/PREPARATION COSTS DURING INVESTMENT PERIOD ($/YEAR)								
	0.00	150,000.00	75,000.00	0.00	0.00					
FPST		PROCUREMENT LEAD AND SAFETY LEVEL STOCKAGE TIME FOR INITIAL SPARE AND REPAIR PARTS (DAYS)								
	411.00									
FR	(5)	RELIABILITY IMPROVEMENT OR DEGRIDATION FACTOR (DIMENSIONLESS)								
	1.00	1.00	1.00	0.90	0.75					
IPCON	(5)	ANNUAL INFLATION RATE FOR FUTURE COSTS FOR CONSTRUCTION TYPE OF FUNDING (RATIO)								
	0.06	0.06	0.06	0.06	0.06					
IROM	(5)	ANNUAL INFLATION RATE FOR FUTURE COSTS OF O&M TYPE OF FUNDING (RATIO)								
	0.05	0.05	0.05	0.05	0.05					
IRPROC	(5)	ANNUAL INFLATION RATE FOR FUTURE COSTS OF PROCUREMENT TYPE OF FUNDING (RATIO)								
	0.07	0.07	0.07	0.07	0.07					
IRRD	(5)	ANNUAL INFLATION RATE FOR FUTURE COSTS OF R&D TYPE OF FUNDING (RATIO)								
	0.05	0.05	0.05	0.05	0.05					

* READ ARRAY VALUES FROM LEFT TO RIGHT *

* READ ARRAY VALUES FROM LEFT TO RIGHT *

DATE 11/ 1/76 SAMPLE COMPUTER RUN FOR NAVMAT EQUIPMENT LIFE CYCLE COST MODEL PAGE 4.004

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME		DESCRIPTION								
ISSD	(5)	STORAGE SPACE REQUIRED FOR THE DEPOT INVENTORY (SQ. FT./YEAR)								
	0.00	250.00	250.00	250.00	250.00					
ISSI	(5)	STORAGE SPACE REQUIRED FOR THE O/I INVENTORY (SQ. FT./YEAR)								
	0.00	1,000.00	1,000.00	1,000.00	1,000.00					
IYI		YEAR DURING WHICH INITIAL COST OCCUR (DIMENSIONLESS)								
	2.00									
LO	(5)	DESIRED MANNING LEVEL FOR OPERATING PERSONNEL (PERSONNEL/YEAR)								
	0.00	0.00	80.00	100.00	100.00					
LM	(5)	DESIRED MANNING LEVEL FOR O/I LEVEL MAINTENANCE PERSONNEL (PERSONNEL/YEAR)								
	0.00	0.00	80.00	100.00	100.00					
LP	(5)	DESIRED MANNING LEVEL FOR DEPOT LEVEL MAINTENANCE PERSONNEL (PERSONNEL/YEAR)								
	0.00	0.00	10.00	10.00	10.00					
LPM	(2)	PREVENTIVE MAINTENANCE LABOR TIME FOR NTH MAINTENANCE ACTION (HR/ACTION)								
	8.00	15.00								
LSD	(15)	DEPOT MAINTENANCE LABOR TIME TO REPAIR THE KTH ITEM (HR/ITEM)								
	0.00	7.00	18.00	6.00	0.00	9.00	6.00	20.00	5.00	5.00
	5.00	5.00	10.00	5.00	15.00					
LSI	(15)	O/I LEVEL MAINTENANCE LABOR TIME TO REPAIR THE KTH ITEM (HR/ITEM)								
	0.00	5.00	12.00	4.00	8.00	6.00	5.00	15.00	3.00	3.00
	3.00	3.00	7.00	3.00	11.00					
LSO	(15)	O/I LEVEL MAINTENANCE LABOR TIME TO REMOVE AND REPLACE THE KTH ITEM (HR/ITEM)								
	3.00	2.00	1.80	2.60	4.00	3.00	3.00	4.00	2.00	2.00
	2.00	2.00	4.00	1.00	3.00					
MPM	(2)	MATERIAL COST FOR NTH TYPE OF PREVENTIVE MAINTENANCE ACTION ($/ACTION)								
	50.00	150.00								
MSSD	(5)	SHOP SPACE REQUIRED FOR DEPOT LEVEL MAINTENANCE (SQ. FT./YEAR)								
	0.00	150.00	150.00	150.00	150.00					
MSSI	(5)	SHOP SPACE REQUIRED FOR O/I LEVEL MAINTENANCE (SQ. FT./YEAR)								
	0.00	1,000.00	1,000.00	1,000.00	1,000.00					
N	(5)	NUMBER OF EQUIPMENTS IN THE NAVY'S INVENTORY SYSTEM (EQUIP./YEAR)								
	0.00	0.00	80.00	100.00	100.00					
NC	(5)	NUMBER OF COPIES OF TECHNICAL DATA TO BE DISTRIBUTED AND INVENTORIED (COPIES/YEAR)								
	0.00	25.00	0.00	0.00	0.00					

* READ ARRAY VALUES FROM LEFT TO RIGHT *

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME		DESCRIPTION
NK	15	TOTAL NUMBER OF SPARE/REPAIR ITEMS IN THE PRIME EQUIPMENT (DIMENSIONLESS)
NM	2	TOTAL NUMBER OF PREVENTIVE MAINTENANCE TYPES OF THE PRIME EQUIPMENT (DIMENSIONLESS)
NN	(5) 0.00 50.00 30.00 20.00 0.00	PRIME EQUIPMENT ANNUAL ACCEPTANCE SCHEDULE (EQUIP./YEAR)
NOH	(5) 0.00 0.00 0.00 0.00 80.00	PRIME EQUIPMENT OVERHAUL SCHEDULE (EQUIP./YEAR)
NP	200.00	NUMBER OF PAGES PER TECHNICAL MANUAL MAINTAINED BY NAVY (PAGES/COPY)
NPM	(2) 100.00 600.00	TIME BETWEEN INSPECTIONS OF THE PREVENTIVE MAINTENANCE ACTIONS (HR/ACTION)
NPO	(5) 0.00 0.00 0.00 0.00 15.00	PRIME EQUIPMENT PHASE OUT SCHEDULE (EQUIP./YEAR)
NSNP	75.00	TOTAL NUMBER OF NEW NATIONAL STOCK NUMBERS TO BE ISSUED ON THE PRIME EQUIPMENT (NSN)
NSNS	357.00	TOTAL NUMBER OF NEW NATIONAL STOCK NUMBERS TO BE ISSUED ON THE PECULIAR S&TE EQUIPMENTS (NSN)
OHL	120.00	PRIME EQUIPMENT OVERHAUL MAINTENANCE LABOR TIME (HR/EQUIP.)
OHM	1,500.00	PRIME EQUIPMENT OVERHAUL MAINTENANCE MATERIAL COST ($/EQUIP.)
OHT	500.00	PRIME EQUIPMENT OVERHAUL MAINTENANCE MATERIAL SHIPPING RATE ($/EQUIP.)
OT	1,600.00	PRIME EQUIPMENT ANNUAL OPERATING TIME (HR/YEAR)
PMG	(5) 0.00 650,000.00 270,000.00 0.00 0.00	GOVERNMENT PROJECT MANAGEMENT COSTS INCURRED DURING INVESTMENT PERIOD ($/YEAR)
PO	1.00	NUMBER OF PERSONNEL REQUIRED TO OPERATE A PRIME EQUIPMENT (PERSONNEL/EQUIP.)
PSQS	50.00	FLOOR SPACE REQUIRED FOR THE OPERATION OF A PRIME EQUIPMENT (SQ. FT./EQUIP.)

* READ ARRAY VALUES FROM LEFT TO RIGHT *

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME		DESCRIPTION								
PSS	(5)	PRODUCTION SUPPORT & SERVICES COST INCURRED DURING THE INVESTMENT PERIOD ($/YEAR)								
	0.00	350,000.00	0.00	0.00	0.00					
PTE	(5)	PRODUCTION TEST & EVALUATION COSTS INCURRED DURING THE INVESTMENT PERIOD ($/YEAR)								
	0.00	50,000.00	0.00	0.00	0.00					
PTI	(5)	NUMBER OF INSTRUCTORS TO RECEIVE INITIAL TRAINING (STUDENT/YEAR)								
	0.00	15.00	0.00	0.00	0.00					
PTM	(5)	NUMBER OF O/I MAINTENANCE PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR)								
	0.00	50.00	30.00	20.00	0.00					
PTO	(5)	NUMBER OF OPERATING PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR)								
	0.00	50.00	30.00	20.00	0.00					
PTP	(5)	NUMBER OF DEPOT MAINTENANCE PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR)								
	0.00	10.00	0.00	0.00	0.00					
QTY	(15)	NUMBER OF QUANTITIES OF A SPARE/REPAIR ITEM (QUANTITY/ITEM)								
	2.00	4.00	1.00	3.00	6.00	1.00	2.00	1.00	2.00	2.00
	2.00	2.00	1.00	1.00	1.00					
R	(15)	MEAN TIME BETWEEN FAILURES OF THE SPARE/REPAIR ITEM (HR/ITEM)								
	750.00	500.00	870.00	600.00	250.00	400.00	600.00	900.00	350.00	350.00
	350.00	350.00	700.00	1,200.00	1,500.00					
RAM		OPERATOR AND O/I LEVEL MAINTENANCE PERSONNEL ATTRITION RATE (RATIO)								
	0.40									
RAP		DEPOT LEVEL MAINTENANCE PERSONNEL ATTRITION RATE (RATIO)								
	0.13									
RDM		TECHNICAL DATA MANAGEMENT COST FOR FILE MAINTENANCE ($/PAGE/YEAR)								
	100.00									
RIE		AVERAGE NATIONAL STOCK NUMBER (NSN) ENTRY COST INTO THE SUPPLY SYSTEM ($/NSN)								
	100.00									
RIM		SUPPLY SUPPORT MANAGEMENT ITEM RETENTION AND FIELD ADMINISTRATION COST ($/NSN)								
	100.00									
RO		PRIME EQUIPMENT OPERATOR HOURLY PAY RATE ($/HR/OPERATOR)								
	7.87									
RPL		PACKAGING LABOR COST ($/LB.)								
	1.00									
RPM		PACKAGING MATERIAL COST ($/LB.)								
	0.50									

* READ ARRAY VALUES FROM LEFT TO RIGHT *

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME		DESCRIPTION								
RSD		DEPOT MAINTENANCE PERSONNEL PAY RATE TO REPAIR FAILED ITEMS ($/HR/MAN)								
	17.22									
RSL		O/I MAINTENANCE PERSONNEL PAY RATE TO REMOVE, REPLACE OR REPAIR FAILED ITEMS ($/HR/MAN)								
	7.87									
RSR		AVERAGE SHIPPING COST ($/LB.)								
	0.10									
RSS	(15)	FRACTION OF FAILURES REPAIRED AT THE INTERMEDIATE MAINTENANCE LEVEL FOR THE KTH ITEM (RATIO)								
	1.00	0.80	0.70	0.50	1.00	0.80	0.60	0.90	0.85	0.65
	0.85	0.85	0.50	0.70	0.40					
RW	(15)	RATIO OF THE SHIPPING WEIGHT TO THE UNPACKED WEIGHT OF THE KTH ITEM (RATIO)								
	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
	1.25	1.25	1.25	1.25	1.25					
STE	(5)	SUPPORT & TEST EQUIPMENT ACQUISITION COST ($/YEAR)								
	500,000.00	0.00	0.00	0.00	0.00					
STEM		SUPPORT & TEST EQUIPMENT INITIAL SUPPORT RATE, PERCENT OF S&TE ACQUISITION COST (RATIO)								
	0.25									
STES		SUPPORT & TEST EQUIPMENT RECURRING SUPPORT COST PER PRIMEEQUIPMENT ($/EQUIP.)								
	5,000.00									
TERM		TERMINATION COST AND/OR VALUE OF THE PRIME EQUIPMENT ($/EQUIP.)								
	1,200.00									
W	(15)	UNPACKED WEIGHT OF THE KTH ITEM (LB./ITEM)								
	75.00	100.00	170.00	300.00	250.00	190.00	300.00	50.00	600.00	450.00
	275.00	310.00	140.00	260.00	700.00					
Y		NUMBER OF YEARS COVERED BY THE LIFE CYCLE ANALYSIS (DIMENSIONLESS)								
	5									

* READ ARRAY VALUES FROM LEFT TO RIGHT *

USER DEFINED SCALARS

NO SCALARS

USER DEFINED ARRAYS

NO ARRAYS

COST ADJUSTMENT FACTORS

YEAR	INFLATION FACTORS				INFLATION AND DISCOUNT FACTORS				DISCOUNT FACTORS
	R & D	PROCUREMENT	CONSTRUCTION	O & M	R & D	PROCUREMENT	CONSTRUCTION	O & M	
1	1.027	1.035	1.030	1.025	0.980	0.986	0.982	0.977	0.955
2	1.084	1.107	1.092	1.076	0.939	0.959	0.946	0.933	0.868
3	1.144	1.185	1.157	1.130	0.901	0.933	0.912	0.890	0.789
4	1.207	1.268	1.227	1.187	0.864	0.908	0.879	0.850	0.717
5	1.273	1.357	1.300	1.246	0.829	0.883	0.847	0.811	0.652

********** MILITARY PERSONNEL FUNDING USES THE SAME COST ADJUSTMENT FACTORS AS O&M **********

SUMMARY

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 ,CONSTANT DOLLARS*****

COST CATEGORY	COST ELEMENT - DEVELOPMENT	INVESTMENT	O&S	COST CATEGORY TOTAL
CONTRACTOR	2,825,000	0	0	2,825,000
% OF COST CATEGORY TOTAL	100.0	0.0	0.0	100.0
% OF COST ELEMENT TOTAL	71.3	0.0	0.0	6.1
PROGRAM MANAGEMENT	800,000	920,000	0	1,720,000
% OF COST CATEGORY TOTAL	46.5	53.5	0.0	100.0
% OF COST ELEMENT TOTAL	20.2	7.9	0.0	3.7
TESTING	325,000	50,000	0	375,000
% OF COST CATEGORY TOTAL	86.7	13.3	0.0	100.0
% OF COST ELEMENT TOTAL	8.2	0.4	0.0	0.8
PRIME EQUIPMENT	0	5,560,000	0	5,560,000
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	47.9	0.0	12.0
TRAINING	10,000	200,000	143,900	353,900
% OF COST CATEGORY TOTAL	2.8	56.5	40.7	100.0
% OF COST ELEMENT TOTAL	0.3	1.7	0.5	0.8
SUPPLY SUPPORT	0	3,262,675	4,582,801	7,845,476
% OF COST CATEGORY TOTAL	0.0	41.6	58.4	100.0
% OF COST ELEMENT TOTAL	0.0	28.1	14.8	16.9
TECHNICAL DATA	0	300,250	80,000	380,250
% OF COST CATEGORY TOTAL	0.0	79.0	21.0	100.0
% OF COST ELEMENT TOTAL	0.0	2.6	0.3	0.8
SUPPORT EQUIPMENT	0	500,000	0	500,000
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	4.3	0.0	1.1
OPERATION	0	225,000	8,050,760	8,275,760
% OF COST CATEGORY TOTAL	0.0	2.7	97.3	100.0
% OF COST ELEMENT TOTAL	0.0	1.9	26.1	17.8
MAINTENANCE	0	600,000	18,025,647	18,625,647
% OF COST CATEGORY TOTAL	0.0	3.2	96.8	100.0
% OF COST ELEMENT TOTAL	0.0	5.2	58.4	40.1
COST ELEMENT TOTAL	3,960,000	11,617,925	30,883,107	46,461,033
% OF LIFE CYCLE COST	8.5	25.0	66.5	100.0

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FUNDING VS. COST CATEGORY

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 ,CONSTANT DOLLARS*****

COST CATEGORY	FUNDING TYPE: R & D	PROCUREMENT	CONSTRUCTION	O & M	MIL. PERSONNEL	OTHERS	COST CATEGORY TOTAL
CONTRACTOR	2,825,000	0	0	0	0	0	2,825,000
% OF COST CATEGORY TOTAL	100.0	0.0	0.0	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	72.4	0.0	0.0	0.0	0.0	0.0	6.1
PROGRAM MANAGEMENT	800,000	920,000	0	0	0	0	1,720,000
% OF COST CATEGORY TOTAL	46.5	53.5	0.0	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	20.5	8.7	0.0	0.0	0.0	0.0	3.7
TESTING	275,000	50,000	50,000	0	0	0	375,000
% OF COST CATEGORY TOTAL	73.3	13.3	13.3	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	7.1	0.5	0.8	0.0	0.0	0.0	0.8
PRIME EQUIPMENT	0	5,560,000	0	0	0	0	5,560,000
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	52.5	0.0	0.0	0.0	0.0	12.0
TRAINING	0	50,000	0	13,900	290,000	0	353,900
% OF COST CATEGORY TOTAL	0.0	14.1	0.0	3.9	81.9	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	0.5	0.0	0.1	4.6	0.0	0.8
SUPPLY SUPPORT	0	3,219,475	0	4,626,001	0	0	7,845,476
% OF COST CATEGORY TOTAL	0.0	41.0	0.0	59.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	30.4	0.0	23.7	0.0	0.0	16.9
TECHNICAL DATA	0	300,250	0	80,000	0	0	380,250
% OF COST CATEGORY TOTAL	0.0	79.0	0.0	21.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	2.8	0.0	0.4	0.0	0.0	0.8
SUPPORT EQUIPMENT	0	500,000	0	0	0	0	500,000
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	4.7	0.0	0.0	0.0	0.0	1.1
OPERATION	0	0	3,585,000	1,165,000	3,525,760	0	8,275,760
% OF COST CATEGORY TOTAL	0.0	0.0	43.3	14.1	42.6	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	0.0	58.2	6.0	56.3	0.0	17.8
MAINTENANCE	0	0	2,523,840	13,658,724	2,443,083	0	18,625,647
% OF COST CATEGORY TOTAL	0.0	0.0	13.6	73.3	13.1	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	0.0	41.0	69.9	39.0	0.0	40.1
FUNDING TYPE TOTAL	3,900,000	10,599,725	6,158,840	19,543,624	6,258,843	0	46,461,033
% OF LIFE CYCLE COST	8.4	22.8	13.3	42.1	13.5	0.0	100.0

COST BREAKDOWN BY YEAR

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 .CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	COST FOR YEAR 1	2	3	4	5
000000	TOTAL LIFE CYCLE	4,935,000	6,393,712	10,996,970	12,147,304	11,988,047
100000	RESEARCH AND DEVELOPMENT	3,960,000	0	0	0	0
110000	VALIDATION	750,000	0	0	0	0
111000	CONTRACTOR	500,000	0	0	0	0
112000	GOVERNMENT	250,000	0	0	0	0
120000	FULL SCALE DEVELOPMENT	3,210,000	0	0	0	0
121000	CONTRACTOR	2,325,000	0	0	0	0
121100	MANAGEMENT	200,000	0	0	0	0
121200	ENGINEERING	800,000	0	0	0	0
121300	PROTOTYPE HARDWARE	600,000	0	0	0	0
121400	SOFTWARE	150,000	0	0	0	0
121500	TEST & EVALUATION	75,000	0	0	0	0
121600	DOCUMENTATION	150,000	0	0	0	0
121700	SUPPORT & TEST EQUIPMENT	350,000	0	0	0	0
122000	GOVERNMENT	885,000	0	0	0	0
122100	PROGRAM MANAGEMENT	550,000	0	0	0	0
122200	PROTOTYPE TEST & EVALUATION	335,000	0	0	0	0
122210	TRAINING	10,000	0	0	0	0
122220	TEST SITE ACTIVATION	50,000	0	0	0	0
122230	TEST & EVALUATION	275,000	0	0	0	0
200000	INVESTMENT	975,000	5,849,552	3,053,661	1,739,712	0
210000	GOVERNMENT PROGRAM MANAGEMENT	0	650,000	270,000	0	0
220000	PRIME EQUIPMENT ACQUISITION	0	3,005,000	1,563,000	1,042,000	0
221000	PRODUCTION HARDWARE	0	2,500,000	1,500,000	1,000,000	0
222000	PRODUCTION SUPPORT & SERVICES	0	350,000	0	0	0
223000	PRODUCTION TEST & EVALUATION	0	50,000	0	0	0
224000	TRANSPORTATION	0	30,000	18,000	12,000	0
225000	INSTALLATION & CHECKOUT	0	75,000	45,000	30,000	0
230000	INITIAL SUPPORT ACQUISITION	975,000	2,194,552	1,220,661	697,712	0
231000	SUPPORT & TEST EQUIPMENT ACQUISITION	500,000	0	0	0	0
232000	SUPPLY SUPPORT	125,000	1,556,802	908,161	672,712	0
232100	INITIAL SPARES	125,000	1,513,602	908,161	672,712	0
232110	PRIME EQUIPMENT	0	1,513,602	908,161	672,712	0
232120	SUPPORT & TEST EQUIPMENT	125,000	0	0	0	0
232200	MSN ENTRY INTO THE SUPPLY SYSTEM	0	43,200	0	0	0
233000	FACILITIES	0	550,000	275,000	0	0
		0	150,000	75,000	0	0
233200	MAINTENANCE	0	400,000	200,000	0	0
234000	DOCUMENTATION	300,000	250	0	0	0
234100	ACQUISITION	300,000	0	0	0	0
234200	REPRODUCTION AND DISTRIBUTION	0	250	0	0	0
235000	TRAINING	50,000	87,500	37,500	25,000	0
235100	OPERATOR	0	25,000	15,000	10,000	0
235200	O/I LEVEL MAINTENANCE	0	37,500	22,500	15,000	0

235200	O/I LEVEL MAINTENANCE	0	37,000	22,500	15,000	0

COST BREAKDOWN BY YEAR

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 ,CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	COST FOR YEAR 1	2	3	4	5
235300	DEPOT LEVEL MAINTENANCE	0	10,000	0	0	0
235400	INSTRUCTOR	0	15,000	0	0	0
235500	TRAINING AIDS	50,000	0	0	0	0
300000	OPERATING AND SUPPORT	0	544,160	7,943,308	10,407,592	11,988,847
310000	OPERATION	0	0	2,302,360	2,874,200	2,874,200
311000	PERSONNEL	0	0	1,007,360	1,259,200	1,259,200
312000	FACILITIES	0	0	960,000	1,200,000	1,200,000
313000	ENERGY CONSUMPTION	0	0	256,000	320,000	320,000
314000	MATERIAL CONSUMPTION	0	0	64,000	80,000	80,000
315000	SOFTWARE MAINTENANCE	0	0	15,000	15,000	15,000
320000	SUPPORT	0	544,160	5,640,948	7,533,392	9,095,847
321000	CORRECTIVE MAINTENANCE	0	0	3,370,756	4,681,606	5,617,927
321100	LABOR	0	0	643,270	893,430	1,072,116
321110	O/I LEVEL (REMOVE & REPLACE)	0	0	197,465	274,257	329,108
321120	O/I LEVEL (REPAIR)	0	0	313,656	435,633	522,760
321130	DEPOT LEVEL (REPAIR)	0	0	132,149	183,540	220,248
321200	REPAIR MATERIAL	0	0	1,612,732	2,239,905	2,687,886
321300	TRANSPORTATION AND PACKAGING	0	0	1,114,755	1,548,271	1,857,925
321310	MATERIAL HANDLING LABOR	0	0	683,899	949,859	1,139,831
321320	PACKAGING MATERIAL	0	0	341,949	474,930	569,916
321330	SHIPPING	0	0	88,907	123,482	148,178
322000	PREVENTIVE MAINTENANCE	0	0	201,773	252,216	252,216
322100	LABOR	0	0	105,773	132,216	132,216
322200	MATERIAL	0	0	96,000	120,000	120,000
323000	OVERHAUL	0	0	0	0	325,312
323100	LABOR	0	0	0	0	165,312
323200	MATERIAL	0	0	0	0	120,000
323300	TRANSPORTATION	0	0	0	0	40,000
324000	SUPPORT & TEST EQUIPMENT MAINTENANCE	0	0	400,000	500,000	500,000
325000	FACILITIES	0	480,960	480,960	480,960	480,960
325100	SHOP SPACE	0	240,360	240,360	240,360	240,360
325110	O/I LEVEL	0	240,000	240,000	240,000	240,000
325120	DEPOT LEVEL	0	360	360	360	360
325200	INVENTORY STORAGE	0	240,600	240,600	240,600	240,600
325210	O/I LEVEL	0	240,000	240,000	240,000	240,000
325220	DEPOT LEVEL	0	600	600	600	600
326000	DOCUMENTATION MAINTENANCE	0	20,000	20,000	20,000	20,000
327000	SUPPLY SUPPORT	0	43,200	1,126,159	1,547,310	1,848,132
327100	REPLENISHMENT SPARES	0	0	1,082,959	1,504,110	1,804,932
327200	SUPPLY SYSTEM MANAGEMENT	0	43,200	43,200	43,200	43,200
328000	TRAINING	0	0	41,300	51,300	51,300
328100	OPERATOR	0	0	16,000	20,000	20,000
328200	O/I LEVEL MAINTENANCE	0	0	24,000	30,000	30,000
328300	DEPOT LEVEL MAINTENANCE	0	0	1,300	1,300	1,300
330000	TERMINATION	0	0	0	0	10,000

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COST BREAKDOWN TOTALS

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 ,CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	TOTAL ADJUSTED COST	<----------PERCENTS OF TOTAL ADJUSTED COST FOR TOTAL LIFE CYCLE---------->
000000	TOTAL LIFE CYCLE	46,461,033	100.0
100000	RESEARCH AND DEVELOPMENT	3,960,000	8.5
110000	VALIDATION	750,000	1.6
111000	CONTRACTOR	500,000	1.1
112000	GOVERNMENT	250,000	0.5
120000	FULL SCALE DEVELOPMENT	3,210,000	6.9
121000	CONTRACTOR	2,325,000	5.0
121100	MANAGEMENT	200,000	0.4
121200	ENGINEERING	800,000	1.7
121300	PROTOTYPE HARDWARE	600,000	1.3
121400	SOFTWARE	150,000	0.3
121500	TEST & EVALUATION	75,000	0.2
121600	DOCUMENTATION	150,000	0.3
121700	SUPPORT & TEST EQUIPMENT	350,000	0.8
122000	GOVERNMENT	885,000	1.9
122100	PROGRAM MANAGEMENT	550,000	1.2
122200	PROTOTYPE TEST & EVALUATION	335,000	0.7
122210	TRAINING	10,000	0.0
122220	TEST SITE ACTIVATION	50,000	0.1
122230	TEST & EVALUATION	275,000	0.6
200000	INVESTMENT	11,617,925	25.0
210000	GOVERNMENT PROGRAM MANAGEMENT	920,000	2.0
220000	PRIME EQUIPMENT ACQUISITION	5,610,000	12.1
221000	PRODUCTION HARDWARE	5,000,000	10.8
222000	PRODUCTION SUPPORT & SERVICES	350,000	0.8
223000	PRODUCTION TEST & EVALUATION	50,000	0.1
224000	TRANSPORTATION	60,000	0.1
225000	INSTALLATION & CHECKOUT	150,000	0.3
230000	INITIAL SUPPORT ACQUISITION	5,087,925	11.0
231000	SUPPORT & TEST EQUIPMENT ACQUISITION	500,000	1.1
232000	SUPPLY SUPPORT	3,262,675	7.0
232100	INITIAL SPARES	3,219,475	6.9
232110	PRIME EQUIPMENT	3,094,475	6.7
232120	SUPPORT & TEST EQUIPMENT	125,000	0.3
232200	NSN ENTRY INTO THE SUPPLY SYSTEM	43,200	0.1
233000	FACILITIES	825,000	1.8
		229,000	0.5
233200	MAINTENANCE	600,000	1.3
234000	DOCUMENTATION	300,250	0.6
234100	ACQUISITION	300,000	0.6
234200	REPRODUCTION AND DISTRIBUTION	250	0.0
235000	TRAINING	200,000	0.4
235100	OPERATOR	50,000	0.1
235200	O/I LEVEL MAINTENANCE	75,000	0.2

COST BREAKDOWN TOTALS

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 ,CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	TOTAL ADJUSTED COST	<----------PERCENTS OF TOTAL ADJUSTED COST----------> < FOR TOTAL LIFE CYCLE >			
235300	DEPOT LEVEL MAINTENANCE	10,000		0.0		
235400	INSTRUCTOR	15,000		0.0		
235500	TRAINING AIDS	50,000		0.1		
300000	OPERATING AND SUPPORT	30,887,107				66.5
310000	OPERATION	8,050,760			17.3	
311000	PERSONNEL	3,525,760		7.6		
312000	FACILITIES	3,360,000		7.2		
313000	ENERGY CONSUMPTION	896,000		1.9		
314000	MATERIAL CONSUMPTION	224,000		0.5		
315000	SOFTWARE MAINTENANCE	45,000		0.1		
320000	SUPPORT	22,814,347			49.1	
321000	CORRECTIVE MAINTENANCE	13,670,290		29.4		
321100	LABOR	2,608,816		5.6		
321110	O/I LEVEL (REMOVE & REPLACE)	800,829	1.7			
321120	O/I LEVEL (REPAIR)	1,272,049	2.7			
321130	DEPOT LEVEL (REPAIR)	535,937	1.2			
321200	REPAIR MATERIAL	6,540,523		14.1		
321300	TRANSPORTATION AND PACKAGING	4,520,951		9.7		
321310	MATERIAL HANDLING LABOR	2,773,590	6.0			
321320	PACKAGING MATERIAL	1,386,795	3.0			
321330	SHIPPING	360,567	0.8			
322000	PREVENTIVE MAINTENANCE	706,205		1.5		
322100	LABOR	370,205		0.8		
322200	MATERIAL	336,000		0.7		
323000	OVERHAUL	325,312		0.7		
323100	LABOR	165,312		0.4		
323200	MATERIAL	120,000		0.3		
323300	TRANSPORTATION	40,000		0.1		
324000	SUPPORT & TEST EQUIPMENT MAINTENANCE	1,400,000		3.0		
325000	FACILITIES	1,923,840		4.1		
325100	SHOP SPACE	961,440		2.1		
325110	O/I LEVEL	960,000	2.1			
325120	DEPOT LEVEL	1,440	0.0			
325200	INVENTORY STORAGE	962,400		2.1		
325210	O/I LEVEL	960,000	2.1			
325220	DEPOT LEVEL	2,400	0.0			
326000	DOCUMENTATION MAINTENANCE	80,000		0.2		
327000	SUPPLY SUPPORT	4,564,801		9.8		
327100	REPLENISHMENT SPARES	4,392,001		9.5		
327200	SUPPLY SYSTEM MANAGEMENT	172,800		0.4		
328000	TRAINING	143,900		0.3		
328100	OPERATOR	56,000		0.1		
328200	O/I LEVEL MAINTENANCE	84,000		0.2		
328300	DEPOT LEVEL MAINTENANCE	3,900		0.0		
330000	TERMINATION	18,000			0.0	

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GENERAL FUNDING REPORT

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 *CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	<- - - - - - - - - - GENERAL TYPE OF FUNDING - - - - - - - - - -> R & D	PROCURE-MENT	CONSTRUC-TION	O & M	MIL. PER-SONNEL	OTHERS	TOTAL
000000	TOTAL LIFE CYCLE	3,980,000	10,599,725	6,158,840	19,543,624	6,258,843		846,461,033
100000	RESEARCH AND DEVELOPMENT	3,900,000	0	50,000	0	10,000	0	3,960,000
110000	VALIDATION	750,000	0	0	0	0	0	750,000
111000	CONTRACTOR	500,000	0	0	0	0	0	500,000
112000	GOVERNMENT	250,000	0	0	0	0	0	250,000
120000	FULL SCALE DEVELOPMENT	3,150,000	0	50,000	0	10,000	0	3,210,000
121000	CONTRACTOR	2,325,000	0	0	0	0	0	2,325,000
121100	MANAGEMENT	200,000	0	0	0	0	0	200,000
121200	ENGINEERING	800,000	0	0	0	0	0	800,000
121300	PROTOTYPE HARDWARE	600,000	0	0	0	0	0	600,000
121400	SOFTWARE	150,000	0	0	0	0	0	150,000
121500	TEST & EVALUATION	75,000	0	0	0	0	0	75,000
121600	DOCUMENTATION	150,000	0	0	0	0	0	150,000
121700	SUPPORT & TEST EQUIPMENT	350,000	0	0	0	0	0	350,000
122000	GOVERNMENT	825,000	0	50,000	0	10,000	0	885,000
122100	PROGRAM MANAGEMENT	550,000	0	0	0	0	0	550,000
122200	PROTOTYPE TEST & EVALUATION	275,000	0	50,000	0	10,000	0	335,000
122210	TRAINING	0	0	0	0	10,000	0	10,000
122220	TEST SITE ACTIVATION	0	0	50,000	0	0	0	50,000
122230	TEST & EVALUATION	275,000	0	0	0	0	0	275,000
200000	INVESTMENT		10,599,725	825,000	53,200	140,000		11,617,925
210000	GOVERNMENT PROGRAM MANAGEMENT	0	920,000	0	0	0	0	920,000
220000	PRIME EQUIPMENT ACQUISITION	0	5,610,000	0	0	0	0	5,610,000
221000	PRODUCTION HARDWARE	0	5,000,000	0	0	0	0	5,000,000
222000	PRODUCTION SUPPORT & SERVICES	0	350,000	0	0	0	0	350,000
223000	PRODUCTION TEST & EVALUATION	0	50,000	0	0	0	0	50,000
224000	TRANSPORTATION	0	60,000	0	0	0	0	60,000
225000	INSTALLATION & CHECKOUT	0	150,000	0	0	0	0	150,000
230000	INITIAL SUPPORT ACQUISITION	0	4,069,725	825,000	53,200	140,000	0	5,087,925
231000	SUPPORT & TEST EQUIPMENT ACQUISITION	0	500,000	0	0	0	0	500,000
232000	SUPPLY SUPPORT	0	3,219,475	0	43,200	0	0	3,262,675
232100	INITIAL SPARES	0	3,219,475	0	0	0	0	3,219,475
232110	PRIME EQUIPMENT	0	3,094,475	0	0	0	0	3,094,475
232120	SUPPORT & TEST EQUIPMENT	0	125,000	0	0	0	0	125,000
232200	NSN ENTRY INTO THE SUPPLY SYSTEM	0	0	0	43,200	0	0	43,200
233000	FACILITIES	0	0	825,000	0	0	0	825,000
233100	OPERATIONAL	0	0	225,000	0	0	0	225,000
233200	MAINTENANCE	0	0	600,000	0	0	0	600,000
234000	DOCUMENTATION	0	300,250	0	0	0	0	300,250
234100	ACQUISITION	0	300,000	0	0	0	0	300,000
234200	REPRODUCTION AND DISTRIBUTION	0	250	0	0	0	0	250
235000	TRAINING	0	50,000	0	10,000	140,000	0	200,000
235100	OPERATOR	0	0	0	0	50,000	0	50,000
235200	O/I LEVEL MAINTENANCE	0	0	0	0	75,000	0	75,000

GENERAL FUNDING REPORT

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 *CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	<- - - - - - - - - GENERAL TYPE OF FUNDING - - - - - - - - -> R & D	PROCUREMENT	CONSTRUCTION	O & M	MIL. PERSONNEL	OTHERS	TOTAL
235300	DEPOT LEVEL MAINTENANCE	0	0	0	10,000	0	0	10,000
235400	INSTRUCTOR	0	0	0	0	15,000	0	15,000
235500	TRAINING AIDS	0	50,000	0	0	0	0	50,000
300000	OPERATING AND SUPPORT	0	0	5,283,840	19,490,424	6,108,843		830,883,107
310000	OPERATION	0	0	3,360,000	1,165,000	3,525,760	0	8,050,760
311000	PERSONNEL	0	0	0	0	3,525,760	0	3,525,760
312000	FACILITIES	0	0	3,360,000	0	0	0	3,360,000
313000	ENERGY CONSUMPTION	0	0	0	896,000	0	0	896,000
314000	MATERIAL CONSUMPTION	0	0	0	224,000	0	0	224,000
315000	SOFTWARE MAINTENANCE	0	0	0	45,000	0	0	45,000
320000	SUPPORT	0	0	1,923,840	18,307,424	2,583,083		822,814,347
321000	*CORRECTIVE MAINTENANCE*	0	0		811,597,412	2,072,878		813,670,290
321100	LABOR	0	0	0	535,937	2,072,878	0	2,608,816
321110	O/I LEVEL (REMOVE & REPLACE)	0	0	0	0	808,829	0	808,829
321120	O/I LEVEL (REPAIR)	0	0	0	0	1,272,049	0	1,272,049
321130	DEPOT LEVEL (REPAIR)	0	0	0	535,937	0	0	535,937
321200	REPAIR MATERIAL	0	0	0	6,540,523	0	0	6,540,523
321300	TRANSPORTATION AND PACKAGING	0	0	0	4,520,951	0	0	4,520,951
321310	MATERIAL HANDLING LABOR	0	0	0	2,773,598	0	0	2,773,598
321320	PACKAGING MATERIAL	0	0	0	1,386,795	0	0	1,386,795
321330	SHIPPING	0	0	0	360,567	0	0	360,567
322000	PREVENTIVE MAINTENANCE	0	0	0	336,000	370,205	0	706,205
322100	LABOR	0	0	0	0	370,205	0	370,205
322200	MATERIAL	0	0	0	336,000	0	0	336,000
323000	OVERHAUL	0	0	0	325,312	0	0	325,312
323100	LABOR	0	0	0	165,312	0	0	165,312
323200	MATERIAL	0	0	0	120,000	0	0	120,000
323300	TRANSPORTATION	0	0	0	40,000	0	0	40,000
324000	SUPPORT & TEST EQUIPMENT MAINTENANCE	0	0	0	1,400,000	0	0	1,400,000
325000	FACILITIES	0	0	1,923,840	0	0	0	1,923,840
325100	SHOP SPACE	0	0	961,440	0	0	0	961,440
325110	O/I LEVEL	0	0	960,000	0	0	0	960,000
325120	DEPOT LEVEL	0	0	1,440	0	0	0	1,440
325200	INVENTORY STORAGE	0	0	962,400	0	0	0	962,400
325210	O/I LEVEL	0	0	960,000	0	0	0	960,000
325220	DEPOT LEVEL	0	0	2,400	0	0	0	2,400
326000	DOCUMENTATION MAINTENANCE	0	0	0	80,000	0	0	80,000
327000	SUPPLY SUPPORT	0	0	0	4,564,801	0	0	4,564,801
327100	REPLENISHMENT SPARES	0	0	0	4,392,801	0	0	4,392,801
327200	SUPPLY SYSTEM MANAGEMENT	0	0	0	172,000	0	0	172,000
328000	TRAINING	0	0	0	3,900	140,000	0	143,900
328100	OPERATOR	0	0	0	0	56,000	0	56,000
328200	O/I LEVEL MAINTENANCE	0	0	0	0	84,000	0	84,000
328300	DEPOT LEVEL MAINTENANCE	0	0	0	3,900	0	0	3,900
330000	TERMINATION	0	0	0	10,000	0	0	10,000

DATE 11/ 1/76 SAMPLE COMPUTER RUN FOR NAVMAT EQUIPMENT LIFE CYCLE COST MODEL PAGE 12.001

ANNUAL COST BY FUNDING TYPE

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 *CONSTANT DOLLARS*****

	FUNDING TYPE						
YEAR	R & D	PROCUREMENT	CONSTRUCTION	O & M	MIL. PERSONNEL	OTHERS	TOTAL
1	3,900,000	975,000	50,000	0	10,000	0	4,935,000
2	0	5,168,852	1,030,960	116,400	77,500	0	6,393,712
3	0	2,741,161	1,715,960	4,838,095	1,701,754	0	10,996,970
4	0	1,714,712	1,680,960	6,575,326	2,176,306	0	12,147,304
5	0	0	1,680,960	8,013,803	2,293,284	0	11,988,047
TOTAL	3,900,000	10,599,725	6,158,840	19,543,624	6,258,843	0	46,461,033

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$$$ COSTS IN DOLLARS $$$ ANNUAL COST BY COST CATEGORY

*****BASE YEAR=1 ;CONSTANT DOLLARS*****

YEAR	COST CATEGORY										
	CONTRACTOR	PROGRAM MANAGEMENT	TESTING	PRIME EQUIPMENT	TRAINING	SUPPLY SUPPORT	TECHNICAL DATA	SUPPORT EQUIPMENT	OPERATION	MAIN-TENANCE	TOTAL
1	2,825,000	800,000	325,000	0	60,000	125,000	300,000	500,000	0	0	4,935,000
2	0	650,000	50,000	2,955,000	87,500	1,600,062	20,250	0	150,000	880,960	6,393,712
3	0	270,000	0	1,563,000	78,800	2,014,320	20,000	0	2,377,360	4,653,480	10,996,970
4	0	0	0	1,042,000	76,300	2,220,022	20,000	0	2,874,200	5,914,782	12,147,304
5	0	0	0	0	51,300	1,866,132	20,000	0	2,874,200	7,176,415	11,988,047
TOTAL	2,825,000	1,720,000	375,000	5,560,000	353,900	7,845,476	380,250	500,000	8,275,760	18,625,647	46,461,033

SENSITIVITY ANALYSIS

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 *CONSTANT DOLLARS*****

SENSITIZED VARIABLE:
CU UNIT PRICE OF ONE OF THE CONTRACTORS EQUIPMENT ($/EQUIPMENT)

SEN. NUM.	VALUE	COST ELEMENT DEVELOPMENT $	%	INVESTMENT $	%	OLS $	%	TOTAL LIFE CYCLE $	%
0	50,000,00	3,960,000	0.0	11,617,925	0.0	30,883,107	0.0	46,461,033	0.0
1	25,000,00	3,960,000	0.0	9,117,925	-21.5	30,883,107	0.0	43,961,033	-5.4
2	30,000,00	3,960,000	0.0	9,617,925	-17.2	30,883,107	0.0	44,461,033	-4.3
3	35,000,00	3,960,000	0.0	10,117,925	-12.9	30,883,107	0.0	44,961,033	-3.2
4	40,000,00	3,960,000	0.0	10,617,925	-8.6	30,883,107	0.0	45,461,033	-2.2
5	45,000,00	3,960,000	0.0	11,117,925	-4.3	30,883,107	0.0	45,961,033	-1.1
6	50,000,00	3,960,000	0.0	11,617,925	0.0	30,883,107	0.0	46,461,033	0.0
7	55,000,00	3,960,000	0.0	12,117,925	4.3	30,883,107	0.0	46,961,033	1.1
8	60,000,00	3,960,000	0.0	12,617,925	8.6	30,883,107	0.0	47,461,033	2.2
9	65,000,00	3,960,000	0.0	13,117,925	12.9	30,883,107	0.0	47,961,033	3.2
10	70,000,00	3,960,000	0.0	13,617,925	17.2	30,883,107	0.0	48,461,033	4.3
11	75,000,00	3,960,000	0.0	14,117,925	21.5	30,883,107	0.0	48,961,033	5.4

SEN. NUM. 0 DENOTES BASE VALUES
% - PERCENT CHANGE FROM BASE VALUE

SSS COSTS IN DOLLARS SSS

SENSITIVITY ANALYSIS

*****BASE YEAR=1 *CONSTANT DOLLARS*****

SENSITIZED VARIABLE:
A MEAN TIME BETWEEN FAILURES OF THE SPARE/REPAIR ITEM (HR/ITEM)

SEN. NUM.	VALUE	COST ELEMENT DEVELOPMENT $	%	INVESTMENT $	%	O&S $	%	TOTAL LIFE CYCLE $	%
0	1.00	3,960,000	0.0	11,617,925	0.0	30,883,107	0.0	46,461,033	0.0
1	0.50	3,960,000	0.0	14,712,488	26.6	48,945,398	58.5	67,617,799	45.5
2	0.60	3,960,000	0.0	13,680,909	17.8	42,924,635	39.0	60,569,543	30.4
3	0.70	3,960,000	0.0	12,944,129	11.4	38,624,089	25.1	55,528,218	19.5
4	0.80	3,960,000	0.0	12,391,544	6.7	35,398,680	14.6	51,750,224	11.4
5	0.90	3,960,000	0.0	11,961,756	3.0	32,890,029	6.5	48,811,784	5.1
6	1.00	3,960,000	0.0	11,617,925	0.0	30,883,107	0.0	46,461,033	0.0
7	1.10	3,960,000	0.0	11,336,609	-2.4	29,241,081	-5.3	44,537,690	-4.1
8	1.20	3,960,000	0.0	11,102,179	-4.4	27,872,726	-9.7	42,934,905	-7.6
9	1.30	3,960,000	0.0	10,903,816	-6.1	26,714,887	-13.5	41,578,702	-10.5
10	1.40	3,960,000	0.0	10,737,789	-7.6	25,722,453	-16.7	40,416,242	-13.0
11	1.50	3,960,000	0.0	10,586,433	-8.9	24,862,344	-19.5	39,408,777	-15.2

SEN. NUM. 0 DENOTES BASE VALUES
% - PERCENT CHANGE FROM BASE VALUE

SENSITIVITY ANALYSIS

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 *CONSTANT DOLLARS*****

MATRIX OF VALUES FOR THE SENSITIVITY ANALYSIS OF VARIABLE R

SEN. NUM.	0	1	2	3	4	5	6	7	8	9	10	11
MULTIPLIER	1.00	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50
ARRAY INDEX												
1	750.00	375.00	450.00	525.00	600.00	675.00	750.00	825.00	900.00	975.00	1050.00	1125.00
2	500.00	250.00	300.00	350.00	400.00	450.00	500.00	550.00	600.00	650.00	700.00	750.00
3	870.00	435.00	522.00	609.00	696.00	783.00	870.00	957.00	1044.00	1131.00	1218.00	1305.00
4	600.00	300.00	360.00	420.00	480.00	540.00	600.00	660.00	720.00	780.00	840.00	900.00
5	250.00	125.00	150.00	175.00	200.00	225.00	250.00	275.00	300.00	325.00	350.00	375.00
6	400.00	200.00	240.00	280.00	320.00	360.00	400.00	440.00	480.00	520.00	560.00	600.00
7	600.00	300.00	360.00	420.00	480.00	540.00	600.00	660.00	720.00	780.00	840.00	900.00
8	900.00	450.00	540.00	630.00	720.00	810.00	900.00	990.00	1080.00	1170.00	1260.00	1350.00
9	350.00	175.00	210.00	245.00	280.00	315.00	350.00	385.00	420.00	455.00	490.00	525.00
10	350.00	175.00	210.00	245.00	280.00	315.00	350.00	385.00	420.00	455.00	490.00	525.00
11	350.00	175.00	210.00	245.00	280.00	315.00	350.00	385.00	420.00	455.00	490.00	525.00
12	350.00	175.00	210.00	245.00	280.00	315.00	350.00	385.00	420.00	455.00	490.00	525.00
13	700.00	350.00	420.00	490.00	560.00	630.00	700.00	770.00	840.00	910.00	980.00	1050.00
14	1200.00	600.00	720.00	840.00	960.00	1080.00	1200.00	1320.00	1440.00	1560.00	1680.00	1800.00
15	1500.00	750.00	900.00	1050.00	1200.00	1350.00	1500.00	1650.00	1800.00	1950.00	2100.00	2250.00

SEN. NUM. 0 DENOTES BASE VALUES
% - PERCENT CHANGE FROM BASE VALUE

SUMMARY

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 *INFLATED DOLLARS*****

COST CATEGORY	COST ELEMENT: DEVELOPMENT	INVESTMENT	O&S	COST CATEGORY TOTAL
CONTRACTOR	2,901,275	0	0	2,901,275
% OF COST CATEGORY TOTAL	100.0	0.0	0.0	100.0
% OF COST ELEMENT TOTAL	71.3	0.0	0.0	5.3
PROGRAM MANAGEMENT	821,600	1,013,480	0	1,835,080
% OF COST CATEGORY TOTAL	44.8	55.2	0.0	100.0
% OF COST ELEMENT TOTAL	20.2	7.6	0.0	3.4
TESTING	333,925	55,350	0	389,275
% OF COST CATEGORY TOTAL	85.8	14.2	0.0	100.0
% OF COST ELEMENT TOTAL	8.2	0.4	0.0	0.7
PRIME EQUIPMENT	0	6,444,596	0	6,444,596
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	48.6	0.0	11.9
TRAINING	10,250	217,950	171,482	399,682
% OF COST CATEGORY TOTAL	2.6	54.5	42.9	100.0
% OF COST ELEMENT TOTAL	0.3	1.6	0.5	0.7
SUPPLY SUPPORT	0	3,780,585	5,480,900	9,261,485
% OF COST CATEGORY TOTAL	0.0	40.8	59.2	100.0
% OF COST ELEMENT TOTAL	0.0	28.5	14.8	17.0
TECHNICAL DATA	0	310,777	92,780	403,557
% OF COST CATEGORY TOTAL	0.0	77.0	23.0	100.0
% OF COST ELEMENT TOTAL	0.0	2.3	0.3	0.7
SUPPORT EQUIPMENT	0	517,500	0	517,500
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	3.9	0.0	1.0
OPERATION	0	250,575	9,733,315	9,983,890
% OF COST CATEGORY TOTAL	0.0	2.5	97.5	100.0
% OF COST ELEMENT TOTAL	0.0	1.9	26.3	18.4
MAINTENANCE	0	668,200	21,578,507	22,246,707
% OF COST CATEGORY TOTAL	0.0	3.0	97.0	100.0
% OF COST ELEMENT TOTAL	0.0	5.0	58.2	40.9
COST ELEMENT TOTAL	4,067,050	13,259,013	37,056,985	54,383,048
% OF LIFE CYCLE COST	7.5	24.4	68.1	100.0

SUMMARY

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=1 *INFLATED AND DISCOUNTED*****

COST CATEGORY	COST ELEMENT - DEVELOPMENT	COST ELEMENT - INVESTMENT	COST ELEMENT - O&S	COST CATEGORY TOTAL
CONTRACTOR	2,768,500	0	0	2,768,500
% OF COST CATEGORY TOTAL	100.0	0.0	0.0	100.0
% OF COST ELEMENT TOTAL	71.3	0.0	0.0	6.7
PROGRAM MANAGEMENT	784,000	853,620	0	1,637,620
% OF COST CATEGORY TOTAL	47.9	52.1	0.0	100.0
% OF COST ELEMENT TOTAL	20.2	7.8	0.0	4.0
TESTING	318,600	47,950	0	366,550
% OF COST CATEGORY TOTAL	86.9	13.1	0.0	100.0
% OF COST ELEMENT TOTAL	8.2	0.4	0.0	0.9
PRIME EQUIPMENT	0	5,238,260	0	5,238,260
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	47.8	0.0	12.7
TRAINING	9,770	185,562	121,966	317,299
% OF COST CATEGORY TOTAL	3.1	58.5	38.4	100.0
% OF COST ELEMENT TOTAL	0.3	1.7	0.5	0.8
SUPPLY SUPPORT	0	3,073,237	3,871,233	6,944,470
% OF COST CATEGORY TOTAL	0.0	44.3	55.7	100.0
% OF COST ELEMENT TOTAL	0.0	28.0	14.7	16.9
TECHNICAL DATA	0	296,040	69,680	365,720
% OF COST CATEGORY TOTAL	0.0	80.9	19.1	100.0
% OF COST ELEMENT TOTAL	0.0	2.7	0.3	0.9
SUPPORT EQUIPMENT	0	493,000	0	493,000
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	4.5	0.0	1.2
OPERATION	0	210,300	6,922,267	7,132,567
% OF COST CATEGORY TOTAL	0.0	2.9	97.1	100.0
% OF COST ELEMENT TOTAL	0.0	1.9	26.3	17.3
MAINTENANCE	0	560,800	15,308,075	15,868,875
% OF COST CATEGORY TOTAL	0.0	3.5	96.5	100.0
% OF COST ELEMENT TOTAL	0.0	5.1	58.2	38.6
COST ELEMENT TOTAL	3,880,870	10,958,769	26,293,221	41,132,860
% OF LIFE CYCLE COST	9.4	26.6	63.9	100.0

APPENDIX E

FLEX Technique Sample Computer Run

FLEX Technique Sample Computer Run

This Appendix contains an example of a computer run provided for the user to show the flexible capabilities of the computer program to make changes in the basic NAVMAT LCC Equipment Cost breakdown structure and equations.

All the regular reports are available after the desired changes are implemented.

The following changes are requested :

A. Redefine the contractor costs during the full scale development.

Original format		Requested change	
CS121000	Contractor	CS121000	Contractor
CS121100	Management	CS121100	Prime Contractor
CS121200	Engineering	CS121200	Other Contractor
CS121300	Prototype Hardware		
CS121400	Software		
CS121500	Test & Evaluation		
CS121600	Documentation		
CS121700	Support & Test Equipment		

These changes can be implemented in more than two ways; however, the two basic ways to accomplish the changes are as follows:

1. Delete all of the cost elements under 'Contractor' one by one and then insert the cost elements for 'Prime Contractor' and 'Other Contractor'.

2. Delete the cost element 'Contractor' which automatically deletes all of the lower indenture level cost elements under Contractor, then Reconstruct the cost elements for 'Contractor', 'Prime Contractor', and 'Other Contractor'.

Because it requires fewer changes, in this example the second method is more preferred.

The following cards are prepared to be inserted in the associated files:

Prepare following cards for CS file

```
*(1)       (11)                    (55) (60) (65) (70) (80)
 CS121000                                              1
 CS121000  CONTRACTOR
 CS121100  PRIME CONTRACTOR         1    1    1    1
 EQ121100  DPC(I);I,1,Y
 CS121200  OTHER CONTRACTOR         1    1    1    1
 EQ121200  DOC(I);I,1,Y
```

* Numbers in parentheses indicate the starting column number of the entries.

Note that since CS121000 'Contractor' cost element is not the lowest indenture level no input to describe the cost category, funding type, inflation type is provided, and there is no equation defined for it. The cost of this cost element is the summation of the costs of the cost elements below it.

Because new variables are introduced to define the equations, these values should be described (optional) and values must be entered thru NV file.

Prepare following cards for NV file

```
(1)(5)      (16)
DS DPC(I)   Payment By Government To Prime Contractor For Full Scale
DS DPC(I)   Development Effort During Year I    ($/yr)
NV DPC(Y)   2500000,4*0.
DS DOC(I)   Payment By Government To Other Contractors for Full Scale
DS DOC(I)    Development Effort During Year I     ($/yr)
NV DOC(Y)   750000,4*0.
```

B. Revise the equation for the initial spares for prime equipment (CS232110). Write an equation that provides a thru put by year.

Prepare following cards for CS file

```
(1)         (11)                                          (70)
CS232110                                                  1
EQ232110    ISP(I);I,1,Y
```

Note that a CS Card is necessary to indicate that there is a change requested in this cost element equation.

Prepare following cards for NV file

```
(1)(5)      (16)
DS ISP(I)   Acquisition Cost of Prime Equipment Initial Spares    ($/
DS ISP(I)    yr)
NV ISP(Y)   0,500000,3*0.
```

C. Redefine the funding type and the inflation factor type of the 'Operation and Supply' facilities from MILCOM to O&M.

Prepare following cards for CS file

```
(1)                                          (60) (65)
CS312000                                     4    4
CS325110                                     4    4
CS325120                                     4    4
CS325210                                     4    4
CS325220                                     4    4
```

D. Change the description of CS327200 from 'Supply System Management' to 'Inventory Management'.

Prepare following card for CS file

```
(1)       (11)
CS327200  INVENTORY MANAGEMENT
```

E. Separate termination costs from the operating and support costs, define a new major cost element for "termination' costs, and assign the value of this cost to the last year of the analysis period. Remove termination costs from maintenance cost category and define a new cost category for 'Termination'.

Prepare following cards for CS file

```
(1)       (11)                          (55) (60) (65) (70) (80)
CS330000                                                      1
CS400000  TERMINATION
CS410000  SALVATION                     11   2    2    1
EQ410000  SALV;I,Y,Y
CS420000  DISPOSAL                      11   4    4    1
EQ420000  DISP;I,Y,Y
```

Prepare following cards for NV file

```
(1) (5)    (16)
DS  SALV   Salvation cost of the Prime Equipment  ( $ )
NV  SALV   - 250000.
DS  DISP   Disposal cost of the Prime Equipment  ( $ )
NV  DISP   300000.
```

Changes requested in the major cost element heading and cost category name should be done thru the NAMELIST Input Data file.

Prepare following cards for NAMELIST data file

```
(2)
ELT4='TERMINAT','ION',
CAT11='TERMINAT','ION',
```

F. Identify life cycle cost years in four character alpha-numeric presentation.

Prepare following card for NAMELIST data file

```
(2)
YEARS='FY77','FY78','FY79','FY80','FY81',
```

Through deletion and changes of the equations, some of the built-in variables are no longer needed for computational purposes. These variables don't require input values. These variables are:

From change 1.

DCPM(I), DCE(I), DCH(I), DCS(I), DCTE(I), DCD(I), DCST(I)

From change 2.

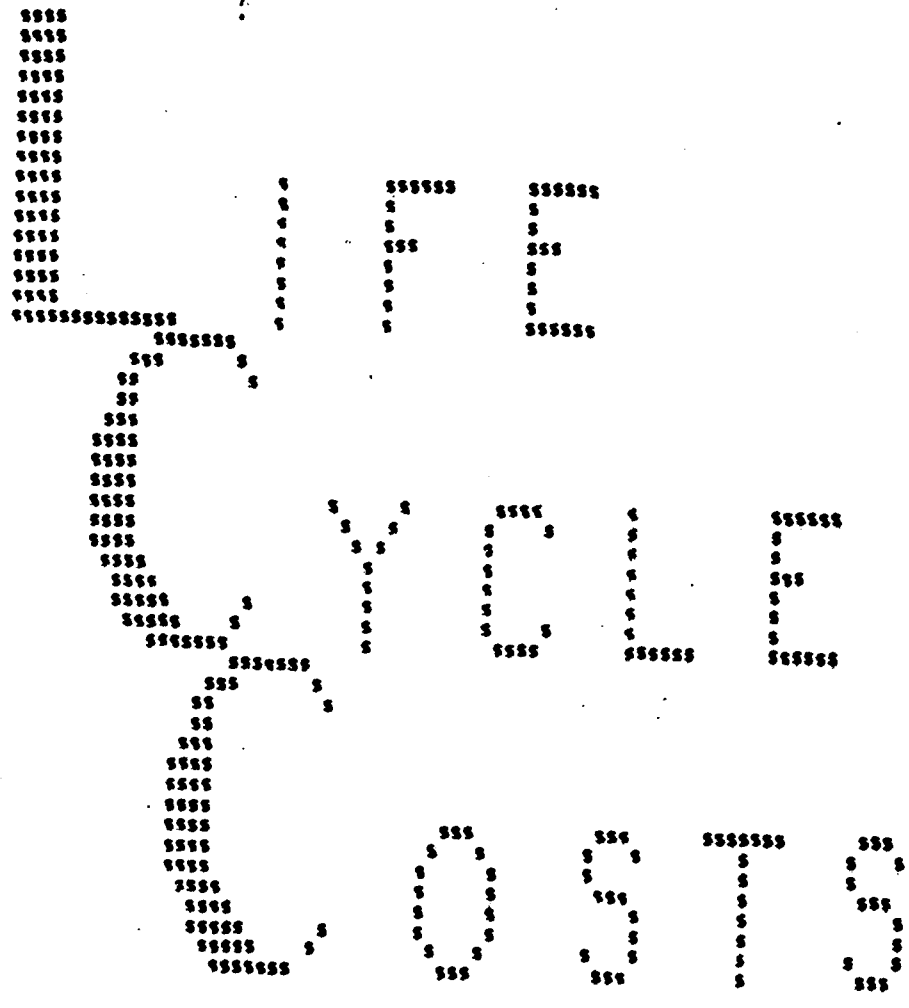
FPST, FILS, FIRT, FDRT

From change 4.

NPO(I), TERM

Since a variable may be used more than one cost element equation these changes should be checked for verification by using table V.2 presented in the documentation.

DATE 11/ 1/76



(LCC FLEX)

ANALYSIS IDENTIFICATION:

SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVMAT LCC MODEL

INPUT DATA LISTING AND ERROR DIAGNOSTICS

```
CN11011111111111   0                                                          1
RM       THIS PROGRAM IS BASED ON COST ALGORITHMS PROVIDED BY THE             2
RM     NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY MANAGEMENT ENGINEERING      3
RM     DEPARTMENT COST MANAGEMENT DIVISION.                                   4
RM       DATA IS PROVIDED FOR SAMPLE PURPOSE ONLY AND SHOULD NOT BE USED      5
RM     AS A BASE FOR INTERPRETATION FOR ANY PROJECT.                          6
RM       QUESTIONS FOR INTERPRETATION OF INPUT DATA OR LCC PHILOSOPHY         7
RM     SHOULD BE DIRECTED TO                                                  8
RM             ALPUAN ATAY                                                    9
RM             NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY ESA-8431            10
RM             WASHINGTON NAVY YARD                                           11
RM             WASHINGTON, D.C.  20374                                        12
RM             PHONE  202-433-4084                                            13
 &INPUT                                                                       14
      BY=1,          CE=2,        CIPE=1500,       CM=.50,       CP=.05,     15
     CSU=2.4,       CSI=240,       CSO=240,      CTT=1000,     CTH=750,      16
     CTO=500,       CTP=1000,     CTPE=600,       CU=50000,                   17
                                    FM=.12,                    IYI=2,        18
      NP=200,      NSNP=75,      NSNS=35 ,       OHL=120,      OHM=1500,     19
     OHT=500,       OT=1600,       PO=1,        POOS=50,      RAM=.40,      20
     RAP=.13,      ROM=100,       RIE=100,      RIM=100,       RO=7.87,     21
     RPL=1.0,      RPM=.5,        RSD=17,22,    RSL=7.87,     RSR=.104,     22
    STEM=.25,      STES=5000,                                                 23
      NM=2,                                                                   24
 NPM=100,600,                                                                 25
 LPM=8,15,                                                                    26
 MPM=50,150,                                                                  27
      NK=15,                                                                  28
 CST=750,1200,5000,4200,1700,2*3500,9000,4*500,2*2500,6000,                   29
 DC=4*.75,1,3*.75,7*1,                                                        30
 DSC=1,,2,2*,1,0,,1,0,8*,1,                                                   31
 LSD=0,7,18,6,0,9,6,20,4*5,10,5,15,                                           32
 LSI=0,5,12,4,8,6,5,15,4*3,7,3,11,                                            33
 LSO=3,2,1,8,2,6,4,2*3,4,4*2,4,1,3,                                           34
 QTY=2,4,1,3,6,1,2,1,4*2,3*1,                                                 35
 R=750,500,870,600,250,400,600,900,4*350,700,1200,1500,                       36
 RSS=1,,8,,7,,5,1,,8,,6,,9,4*,85,,5,,7,,4,                                    37
 RW=15*1.25,                                                                  38
 W=75,100,170,300,250,190,300,50,600,450,275,310,140,260,780,                 39
      Y=5,                                                                    40
 AD=300000,4*0,                                                               41
 ADC=500000,4*0,                                                              42
 ADG=250000,4*0,                                                              43
 ATU=50000,4*0,                                                               44
 CS=2*0,3*15000,                                                              45
 DGPM=550000,4*0,                                                             46
 DGTA=50000,4*0,                                                              47
 DGTE=275000,4*0,                                                             48
```

INPUT DATA LISTING AND ERROR DIAGNOSTICS

```
 DGTT=10000,4*0,                                                                    49
 FMS=0,400000,200000,2*0,                                                           50
 FOS=0,150000,75000,2*0,                                                            51
 FR=3*1,,9,,75,                                                                     52
 ISSO=0,4*250,                                                                      53
 ISSI=0,4*1000,                                                                     54
 LO=2*0,80,2*100,                                                                   55
 MSSO=0,4*150,                                                                      56
 MSSI=0,4*1000,                                                                     57
 NC=0,25,3*0,                                                                       58
 NOH=4*0,80,                                                                        59
 PMG=0,650000,270000,2*0,                                                           60
 PSS=0,350000,3*0,                                                                  61
 PTF=0,50000,3*0,                                                                   62
 PTI=0,15,3*0,                                                                      63
 PTM=0,50,30,20,0,                                                                  64
 PTO=0,50,30,20,0,                                                                  65
 PTP=0,10,3*0,                                                                      66
 STE=500000,4*0,                                                                    67
 N=2*0,80,2*100,                                                                    68
 NN=0,50,30,20,0,                                                                   69
 LM=2*0,80,2*100,                                                                   70
 LP=2*0,3*10,                                                                       71
    IRRO=5*,055, IRPROC=5*,07,   IRCON=5*,06,   IROH=5*,05,      DR=5*,10,         72
 FLT4='TERMINAT','ION',                                                             73
 NOCAT=11,                                                                          74
 CAT11='TERMINAT','ION',                                                            75
 YEARS='FY77','FY78','FY79','FYA0','FY81',                                          76
 &END                                                                               77
SA       CU        25000.    75000.                                                78
SA       R         .5        1.5                                                   79
```

INPUT DATA LISTING AND ERROR DIAGNOSTICS

*** INPUT STATISTICS ***
79 CARDS READ
0 ERRORS

INPUT DATA LISTING AND ERROR DIAGNOSTICS

```
      DS  DISP      DISPOSAL COST OF THE PRIME EQUIPMENT  ( $ )                    1
      NV  DISP      300000.                                                       2
      DS  SALV      SALVATION COST OF THE PRIME EQUIPMENT  ( $ )                  3
      NV  SALV      -250000.                                                      4
      DS  DOC(I)    PAYMENT BY GOVERNMENT TO OTHER CONTRACTORS FOR FULL SCALE      5
      DS  DOC(I)     DEVELOPMENT EFFORT DURING YEAR I  ( $/YR )                   6
      NV  DOC(Y)    750000.,4*0.                                                  7
      DS  DPC(I)    PAYMENT BY GOVERNMENT TO PRIME CONTRACTOR FOR FULL SCALE       8
      DS  DPC(I)    DEVELOPMENT EFFORT DURING YEAR I  ( $/YR )                    9
      NV  DPC(Y)    2500000.,4*0.                                                10
      DS  ISP(I)    ACQUISITION COST OF PRIME EQUIPMENT INITIAL SPARES  ( $/      11
      DS  ISP(I)    YR )                                                         12
      NV  ISP(Y)    0.,500000.,3*0.                                              13
STATISTICS     2 NEW SCALARS     3 NEW ARRAYS     12 NEW ARRAY ELEMENTS
```

INPUT DATA LISTING AND ERROR DIAGNOSTICS

```
CS121000                                                          1      1
CS121000  CONTRACTOR                                                     2
CS121100  PRIME CONTRACTOR                  1    1    1    1           3
EQ121100  DPC(I)II,1,Y                                                   4
CS121200  OTHER CONTRACTOR                  1    1    1    1           5
EQ121200  DOC(I)II,1,Y                                                   6
CS232110                                                    1            7
EQ232110  ISP(I)II,1,Y                                                   8
CS312000                                    4    4                       9
CS325110                                    4    4                      10
CS325120                                    4    4                      11
CS325210                                    4    4                      12
CS325220                                    4    4                      13
CS327200  INVENTORY MANAGEMENT                                           14
CS330000                                                          1      15
CS400000  TERMINATION                                                    16
CS410000  SALVATION                        11    2    2    1           17
EQ410000  SALVII,Y,Y                                                     18
CS420000  DISPOSAL                         11    4    4    1           19
EQ420000  DISPII,Y,Y                                                     20
```

EQUATIONS

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	EQUATION							
000000	TOTAL LIFE CYCLE								
100000	RESEARCH AND DEVELOPMENT								
110000	VALIDATION								
111000	CONTRACTOR	ADC	I	I	I	I	Y		
112000	GOVERNMENT	ADG	I	I	I	I	Y		
120000	FULL SCALE DEVELOPMENT								
121000	CONTRACTOR								
121100	PRIME CONTRACTOR	DPC	I	I	I	I	Y		
121200	OTHER CONTRACTOR	DOC	I	I	I	I	Y		
122000	GOVERNMENT								
122100	PROGRAM MANAGEMENT	DGPM	I	I	I	I	Y		
122200	PROTOTYPE TEST & EVALUATION								
122210	TRAINING	DGTT	I	I	I	I	Y		
122220	TEST SITE ACTIVATION	DGTA	I	I	I	I	Y		
122230	TEST & EVALUATION	DGTE	I	I	I	I	Y		
200000	INVESTMENT								
210000	GOVERNMENT PROGRAM MANAGEMENT	PMG	I	I	I	I	Y		
220000	PRIME EQUIPMENT ACQUISITION								
221000	PRODUCTION HARDWARE	NN	I	CU	*	I	I	I	Y
222000	PRODUCTION SUPPORT & SERVICES	PSS	I	I	I	I	Y		
223000	PRODUCTION TEST & EVALUATION	PTE	I	I	I	I	Y		
224000	TRANSPORTATION	NN	I	CTPE	*	I	I	I	Y
225000	INSTALLATION & CHECKOUT	NN	I	CIPE	*	I	I	I	Y
230000	INITIAL SUPPORT ACQUISITION								
	[illegible] TEST EQUIPMENT ACQUISITION	STE	I	I	I	I	Y		
232000	SUPPLY SUPPORT								
232100	INITIAL SPARES								
232110	PRIME EQUIPMENT	ISP	I	I	I	I	Y		
232120	SUPPORT & TEST EQUIPMENT	STE	I	STEM	*	I	I	I	Y

EQUATIONS

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	EQUATION									
232200	NSN ENTRY INTO THE SUPPLY SYSTEM	NSNP	NSNS	*	RIE	*	I	I	IYI	IYI	
233000	FACILITIES										
233100	OPERATIONAL	FOS	I	I	I	I	Y				
233200	MAINTENANCE	FMS	I	I	I	I	Y				
234000	DOCUMENTATION										
234100	ACQUISITION	AD	I	I	I	I	Y				
234200	REPRODUCTION AND DISTRIBUTION	NC	I	NP	*	CP	*	I	I	I	Y
235000	TRAINING										
235100	OPERATOR	PTO	I	CTO	*	I	I	I	Y		
235200	O/I LEVEL MAINTENANCE	PTM	I	CTM	*	I	I	I	Y		
235300	DEPOT LEVEL MAINTENANCE	PTP	I	CTP	*	I	I	I	Y		
235400	INSTRUCTOR	PTI	I	CTI	*	I	I	I	Y		
235500	TRAINING AIDS	ATII	I	I	I	I	Y				
300000	OPERATING AND SUPPORT										
310000	OPERATION										
311000	PERSONNEL	N	I	PO	*	RO	*	OT	*	I	I
		I	Y								
312000	FACILITIES	N	I	PSOS	*	CSO	*	I	I	I	Y
313000	ENERGY CONSUMPTION	N	I	CE	*	OT	*	I	I	I	Y
314000	MATERIAL CONSUMPTION	N	I	CM	*	OT	*	I	I	I	Y
315000	SOFTWARE MAINTENANCE	CS	I	I	I	I	Y				
320000	SUPPORT										
321000	CORRECTIVE MAINTENANCE										
321100	LABOR										
321110	O/I LEVEL (REMOVE & REPLACE)	N	I	OT	*	DC	K	*	QTY	K	*
		LSO	K	*	RSL	*	R	K	FR	I	*
		/	I	I	I	Y	K	I	NK		

EQUATIONS

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	EQUATION
321120	O/I LEVEL (REPAIR)	N I OT * DC K * QTY K * LST K * RSL * RSS K * 1 DSC K - * R K FR I * / I I 1 Y K 1 NK
321130	DEPOT LEVEL (REPAIR)	N I OT * DC K * QTY K * LSD K * RSD * 1 RSS K - * 1 DSC K - * R K FR I * / I I 1 Y K 1 NK
321200	REPAIR MATERIAL	N I OT * DC K * QTY K * CST K * FM * 1 DSC K - * R K FR I * / I I 1 Y K 1 NK
321300	TRANSPORTATION AND PACKAGING	
321310	MATERIAL HANDLING LABOR	N I OT * DC K * QTY K * 2 * W K * APL * 1 RSS K - * 1 DSC K - * R K FR I * / I I 1 Y K 1 NK
321320	PACKAGING MATERIAL	N I OT * DC K * QTY K * 2 * W K * APM * 1 RSS K - * 1 DSC K - * R K FR I * / I I 1 Y K 1 NK
321330	SHIPPING	N I OT * DC K * QTY K * 2 * W K * RSR * RW K * 1 RSS K - * 1 DSC K - * R K FR I * / I I 1 Y K 1 NK
322000	PREVENTIVE MAINTENANCE	
322100	LABOR	N I OT * LPM N * RSL * NPM N / I I 1 Y N 1 NM
322200	MATERIAL	N I OT * MPM N * NPM N / I I 1 Y N 1 NM
323000	OVERHAUL	
323100	LABOR	NOH I OHL * RSD * I I 1 Y
323200	MATERIAL	NOH I OHM * I I 1 Y
323300	TRANSPORTATION	NOH I OHT * I I 1 Y
324000	SUPPORT & TEST EQUIPMENT MAINTENANCE	N I STES * I I 1 Y

EQUATIONS

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	EQUATION
325000	FACILITIES	
325100	SHOP SPACE	
325110	O/I LEVEL	
		MSSI I CSI * I I I Y
325120	DEPOT LEVEL	
		MSSD I CSD * I I I Y
325200	INVENTORY STORAGE	
325210	O/I LEVEL	
		ISSI I CSI * I I I Y
325220	DEPOT LEVEL	
		ISSD I CSD * I I I Y
326000	DOCUMENTATION MAINTENANCE	
		NP RDN * I I IYI Y
327000	SUPPLY SUPPORT	
327100	REPLENISHMENT SPARES	
		N I OT * DC K * QTY K *
		CST K * DSC K * R K FR I
		* / I I I Y K I NK
327200	INVENTORY MANAGEMENT	
		NSNP NSNS * RIM * I I IYI Y
328000	TRAINING	
328100	OPERATOR	
		LO I RAM * CTO * I I I Y
328200	O/I LEVEL MAINTENANCE	
		LM I RAM * CTM * I I I Y
328300	DEPOT LEVEL MAINTENANCE	
		LP I RAP * CTP * I I I Y
400000	TERMINATION	
410000	SALVATION	
		SALV I I Y Y
420000	DISPOSAL	
		DISP I I Y Y

REMARKS

THIS PROGRAM IS BASED ON COST ALGORITHMS PROVIDED BY THE NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY MANAGEMENT ENGINEERING DEPARTMENT COST MANAGEMENT DIVISION.

DATA IS PROVIDED FOR SAMPLE PURPOSE ONLY AND SHOULD NOT BE USED AS A BASE FOR INTERPRETATION FOR ANY PROJECT.

QUESTIONS FOR INTERPRETATION OF INPUT DATA OR LCC PHILOSOPHY SHOULD BE DIRECTED TO

ALPUAN ATAY
NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY ESA-8431
WASHINGTON NAVY YARD
WASHINGTON, D.C. 20374
PHONE 202-433-4084

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME	DESCRIPTION
AD (5)	ACQUISITION COST OF DATA DURING INVESTMENT PERIOD ($/YEAR)
300,000.00	0.00 0.00 0.00 0.00
ADC (5)	GOVERNMENT PAYMENTS TO THE CONTRACTOR FOR TECHNICAL AND MNAGERIAL WORK PERFORMED DURING VALIDATION PHASE ($/YEAR)
500,000.00	0.00 0.00 0.00 0.00
ADG (5)	GOVERNMENT EXPENDITURES FOR TECHNICAL AND MANAGERIAL WORK PERFORMED DURING VALIDATION PHASE ($/YEAR)
250,000.00	0.00 0.00 0.00 0.00
ATU (5)	ACQUISITION, TRANSPORTATION, AND INSTALLATION COSTS OF TRAINING AIDS AND DEVICES DURING INITIAL TRAINING ($/YEAR)
50,000.00	0.00 0.00 0.00 0.00
BY	BASE YEAR DURING/FROM WHICH ALL COST ADJUSTMENTS ARE MADE (DIMENSIONLESS)
1.00	
CE	ENERGY CONSUMPTION COST INCURRED DURING THE OPERATION OF THE PRIME EQUIPMENT ($/HR/EQUIP.)
2.00	
CIPE	INSTALLATION COST OF THE PRIME EQUIPMENT ($/EQUIP.)
1,500.00	
CM	COST OF MATERIALS CONSUMED DURING THE OPERATION OF THE PRIME EQUIPMENT ($/HR/EQUIP.)
0.50	
CP	AVERAGE COST PER PAGE OF SET-UP, REPRODUCTION AND DISTRIBUTION OF TECHNICAL MANUALS ($/PAGE/COPY)
0.05	
CS (5)	SOFTWARE MAINTENANCE COST DURING PRIME EQUIPMENT OPERATION ($/YEAR)
0.00	0.00 15,000.00 15,000.00 15,000.00
CSD	AREA COST FOR DEPOT LEVEL MAINTENANCE ($/SQ. FT./YEAR)
2.40	
CSI	AREA COST FOR O/I LEVEL MAINTENANCE SPACE ($/SQ. FT./YEAR)
240.00	
CSO	AREA COST FOR OPERATIONAL SPACE ($/SQ. FT./YEAR)
240.00	
CST (15)	UNIT COST OF THE KTH SPARE/REPAIR ITEM ($/ITEM)
750.00	1,200.00 5,000.00 4,200.00 1,700.00 3,500.00 3,500.00 9,000.00 500.00 500.00
500.00	500.00 2,500.00 2,500.00 6,000.00
CTI	AVERAGE INSTRUCTOR TRAINING COST FOR PERSONNEL PAY & ALLOWANCE TRAVEL AND COURSE FEES ($/STUDENT)
1,000.00	

* READ ARRAY VALUES FROM LEFT TO RIGHT *

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME	DESCRIPTION									
CTM	AVERAGE O/I MAINTENANCE PERSONNEL TRAINING COST FOR PAY & ALLOWANCE, TRAVEL AND COURSE FEES ($/STUDENT)									
750.00										
CTO	AVERAGE OPERATING PERSONNEL TRAINING COSTS FOR PAY & ALLOWANCE, TRAVEL AND COURSE FEES ($/STUDENT)									
500.00										
CTP	AVERAGE DEPOT MAINTENANCE PERSONNEL TRAINING COSTS FOR PAY & ALLOWANCE, TRAVEL AND COURSE FEES ($/STUDENT)									
1,000.00										
CTPE	TRANSPORTATION COST OF PRIME EQUIPMENT FROM CONTRACTORS FACILITY TO INSTALLATION SITE ($/EQUIP.)									
600.00										
CU	UNIT PRICE OF ONE OF THE CONTRACTORS EQUIPMENT ($/EQUIPMENT)									
50,000.00										
DC	(15)	DUTY CYCLE OF THE KTH SPARE/REPAIR ITEM (RATIO)								
0.75	0.75	0.75	0.75	1.00	0.75	0.75	0.75	1.00	1.00	
1.00	1.00	1.00	1.00	1.00						
DGPM	(5)	GOVERNMENT PROJECT MANAGEMENT COSTS INCURRED DURING FULL SCALE DEVELOPMENT ($/YEAR)								
550,000.00	0.00	0.00	0.00	0.00						
DGTA	(5)	GOVERNMENT COSTS FOR TEST SITE ACTIVATION/DEACTIVATION DURING FULL SCALE DEVELOPMENT T&E PROGRAM ($/YEAR)								
50,000.00	0.00	0.00	0.00	0.00						
DGTE	(5)	GOVERNMENT PERSONNEL COSTS INCURRED DURING FULL SCALE DEVELOPMENT T&E PROGRAM FOR TESTING & EVALUATION ($/YEAR)								
275,000.00	0.00	0.00	0.00	0.00						
DGTT	(5)	GOVERNMENT COST TO TRAIN STUDENTS DURING FULL SCALE DEVELOPMENT TEST & EVALUATION PROGRAM ($/YEAR)								
10,000.00	0.00	0.00	0.00	0.00						
DR	(5)	ANNUAL DISCOUNT RATE FOR FUTURE COSTS (RATIO)								
0.10	0.10	0.10	0.10	0.10						
DSC	(15)	DISCARD RATE OF THE KTH ITEM (RATIO)								
1.00	0.20	0.10	0.10	0.00	0.10	0.00	0.10	0.10	0.10	
0.10	0.10	0.10	0.10	0.10						
FM	REPAIR MATERIAL RATE (RATIO)									
0.12										
FMS	(5)	MAINTENANCE SITE CONSTRUCTION/PREPARATION COSTS DURING INVESTMENT PERIOD ($/YEAR)								
0.00	400,000.00	200,000.00	0.00	0.00						
FOS	(5)	OPERATIONAL SITE CONSTRUCTION/PREPARATION COSTS DURING INVESTMENT PERIOD ($/YEAR)								
0.00	150,000.00	75,000.00	0.00	0.00						

* READ ARRAY VALUES FROM LEFT TO RIGHT *

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME		DESCRIPTION								
FR	(5)	RELIABILITY IMPROVEMENT OR DEGRIDATION FACTOR (DIMENSIONLESS)								
	1.00	1.00	1.00	0.90	0.75					
IRCON	(5)	ANNUAL INFLATION RATE FOR FUTURE COSTS FOR CONSTRUCTION TYPE OF FUNDING (RATIO)								
	0.06	0.06	0.06	0.06	0.06					
IROM	(5)	ANNUAL INFLATION RATE FOR FUTURE COSTS OF O&M TYPE OF FUNDING (RATIO)								
	0.05	0.05	0.05	0.05	0.05					
IRPROC	(5)	ANNUAL INFLATION RATE FOR FUTURE COSTS OF PROCUREMENT TYPE OF FUNDING (RATIO)								
	0.07	0.07	0.07	0.07	0.07					
IRRD	(5)	ANNUAL INFLATION RATE FOR FUTURE COSTS OF R&D TYPE OF FUNDING (RATIO)								
	0.05	0.05	0.05	0.05	0.05					
ISSD	(5)	STORAGE SPACE REQUIRED FOR THE DEPOT INVENTORY (SQ. FT./YEAR)								
	0.00	250.00	250.00	250.00	250.00					
ISSI	(5)	STORAGE SPACE REQUIRED FOR THE O/I INVENTORY (SQ. FT./YEAR)								
	0.00	1,000.00	1,000.00	1,000.00	1,000.00					
IYI		YEAR DURING WHICH INITIAL COST OCCUR (DIMENSIONLESS)								
	2.00									
LO	(5)	DESIRED MANNING LEVEL FOR OPERATING PERSONNEL (PERSONNEL/YEAR)								
	0.00	0.00	80.00	100.00	100.00					
LM	(5)	DESIRED MANNING LEVEL FOR O/I LEVEL MAINTENANCE PERSONNEL (PERSONNEL/YEAR)								
	0.00	0.00	80.00	100.00	100.00					
LP	(5)	DESIRED MANNING LEVEL FOR DEPOT LEVEL MAINTENANCE PERSONNEL (PERSONNEL/YEAR)								
	0.00	0.00	10.00	10.00	10.00					
LPM	(2)	PREVENTIVE MAINTENANCE LABOR TIME FOR NTH MAINTENANCE ACTION (HR/ACTION)								
	8.00	15.00								
LSD	(15)	DEPOT MAINTENANCE LABOR TIME TO REPAIR THE KTH ITEM (HR/ITEM)								
	0.00	7.00	18.00	6.00	0.00	9.00	6.00	20.00	5.00	5.00
	5.00	5.00	10.00	5.00	15.00					
LSI	(15)	O/I LEVEL MAINTENANCE LABOR TIME TO REPAIR THE KTH ITEM (HR/ITEM)								
	0.00	5.00	12.00	4.00	8.00	6.00	5.00	15.00	3.00	3.00
	3.00	3.00	7.00	3.00	11.00					
LSO	(15)	O/I LEVEL MAINTENANCE LABOR TIME TO REMOVE AND REPLACE THE KTH ITEM (HR/ITEM)								
	3.00	2.00	1.80	2.60	4.00	3.00	3.00	4.00	2.00	2.00
	2.00	2.00	4.00	1.00	3.00					

* READ ARRAY VALUES FROM LEFT TO RIGHT *

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME	DESCRIPTION
NPM (2)	MATERIAL COST FOR NTH TYPE OF PREVENTIVE MAINTENANCE ACTION ($/ACTION)
50.00 150.00	
MSSD (5)	SHOP SPACE REQUIRED FOR DEPOT LEVEL MAINTENANCE (SQ. FT./YEAR)
0.00 150.00 150.00 150.00 150.00	
MSSI (5)	SHOP SPACE REQUIRED FOR O/I LEVEL MAINTENANCE (SQ. FT./YEAR)
0.00 1,000.00 1,000.00 1,000.00 1,000.00	
N (5)	NUMBER OF EQUIPMENTS IN THE NAVY'S INVENTORY SYSTEM (EQUIP./YEAR)
0.00 0.00 80.00 100.00 100.00	
NC (5)	NUMBER OF COPIES OF TECHNICAL DATA TO BE DISTRIBUTED AND INVENTORIED (COPIES/YEAR)
0.00 25.00 0.00 0.00 0.00	
NK	TOTAL NUMBER OF SPARE/REPAIR ITEMS IN THE PRIME EQUIPMENT (DIMENSIONLESS)
15	
NM	TOTAL NUMBER OF PREVENTIVE MAINTENANCE TYPES OF THE PRIME EQUIPMENT (DIMENSIONLESS)
2	
NN (5)	PRIME EQUIPMENT ANNUAL ACCEPTANCE SCHEDULE (EQUIP./YEAR)
0.00 50.00 30.00 20.00 0.00	
NOH (5)	PRIME EQUIPMENT OVERHAUL SCHEDULE (EQUIP./YEAR)
0.00 0.00 0.00 0.00 80.00	
NP	NUMBER OF PAGES PER TECHNICAL MANUAL MAINTAINED BY NAVY (PAGES/COPY)
200.00	
NPM (2)	TIME BETWEEN INSPECTIONS OF THE PREVENTIVE MAINTENANCE ACTIONS (HR/ACTION)
100.00 600.00	
NSNP	TOTAL NUMBER OF NEW NATIONAL STOCK NUMBERS TO BE ISSUED ON THE PRIME EQUIPMENT (NSN)
75.00	
NSNS	TOTAL NUMBER OF NEW NATIONAL STOCK NUMBERS TO BE ISSUED ON THE PECULIAR S&TE EQUIPMENTS (NSN)
350.00	
OML	PRIME EQUIPMENT OVERHAUL MAINTENANCE LABOR TIME (HR/EQUIP.)
120.00	
OMM	PRIME EQUIPMENT OVERHAUL MAINTENANCE MATERIAL COST ($/EQUIP.)
1,500.00	
OMT	PRIME EQUIPMENT OVERHAUL MAINTENANCE MATERIAL SHIPPING RATE ($/EQUIP.)
500.00	

* READ ARRAY VALUES FROM LEFT TO RIGHT *

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME		DESCRIPTION								
OT		PRIME EQUIPMENT ANNUAL OPERATING TIME (HR/YEAR)								
	1,600.00									
PMG	(5)	GOVERNMENT PROJECT MANAGEMENT COSTS INCURRED DURING INVESTMENT PERIOD ($/YEAR)								
	0.00	650,000.00	270,000.00	0.00	0.00					
PO		NUMBER OF PERSONNEL REQUIRED TO OPERATE A PRIME EQUIPMENT (PERSONNEL/EQUIP.)								
	1.00									
PSOS		FLOOR SPACE REQUIRED FOR THE OPERATION OF A PRIME EQUIPMENT (SQ. FT./EQUIP.)								
	50.00									
PSS	(5)	PRODUCTION SUPPORT & SERVICES COST INCURRED DURING THE INVESTMENT PERIOD ($/YEAR)								
	0.00	350,000.00	0.00	0.00	0.00					
PTE	(5)	PRODUCTION TEST & EVALUATION COSTS INCURRED DURING THE INVESTMENT PERIOD ($/YEAR)								
	0.00	50,000.00	0.00	0.00	0.00					
PTI	(5)	NUMBER OF INSTRUCTORS TO RECEIVE INITIAL TRAINING (STUDENT/YEAR)								
	0.00	15.00	0.00	0.00	0.00					
PTM	(5)	NUMBER OF O/I MAINTENANCE PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR)								
	0.00	50.00	30.00	20.00	0.00					
PTO	(5)	NUMBER OF OPERATING PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR)								
	0.00	50.00	30.00	20.00	0.00					
PTP	(5)	NUMBER OF DEPOT MAINTENANCE PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR)								
	0.00	10.00	0.00	0.00	0.00					
QTY	(15)	NUMBER OF QUANTITIES OF A SPARE/REPAIR ITEM (QUANTITY/ITEM)								
	2.00	4.00	1.00	3.00	6.00	1.00	2.00	1.00	2.00	2.00
	2.00	2.00	1.00	1.00	1.00					
R	(15)	MEAN TIME BETWEEN FAILURES OF THE SPARE/REPAIR ITEM (HR/ITEM)								
	750.00	500.00	870.00	600.00	250.00	400.00	600.00	900.00	350.00	350.00
	350.00	350.00	700.00	1,200.00	1,500.00					
RAM		OPERATOR AND O/I LEVEL MAINTENANCE PERSONNEL ATTRITION RATE (RATIO)								
	0.40									
RAP		DEPOT LEVEL MAINTENANCE PERSONNEL ATTRITION RATE (RATIO)								
	0.13									
RDM		TECHNICAL DATA MANAGEMENT COST FOR FILE MAINTENANCE ($/PAGE/YEAR)								
	100.00									

* READ ARRAY VALUES FROM LEFT TO RIGHT *

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

NAME		DESCRIPTION
RIE	100.00	AVERAGE NATIONAL STOCK NUMBER (NSN) ENTRY COST INTO THE SUPPLY SYSTEM ($/NSN)
RIM	100.00	SUPPLY SUPPORT MANAGEMENT ITEM RETENTION AND FIELD ADMINISTRATION COST ($/NSN)
RO	7.87	PRIME EQUIPMENT OPERATOR HOURLY PAY RATE ($/HR/OPERATOR)
RPL	1.00	PACKAGING LABOR COST ($/LB.)
RPM	0.50	PACKAGING MATERIAL COST ($/LB.)
RSD	17.22	DEPOT MAINTENANCE PERSONNEL PAY RATE TO REPAIR FAILED ITEMS ($/HR/MAN)
RSL	7.87	O/I MAINTENANCE PERSONNEL PAY RATE TO REMOVE, REPLACE OR REPAIR FAILED ITEMS ($/HR/MAN)
RSR	0.10	AVERAGE SHIPPING COST ($/LB.)
RSS	(15)	FRACTION OF FAILURES REPAIRED AT THE INTERMEDIATE MAINTENANCE LEVEL FOR THE KTH ITEM (RATIO)
	1.00 0.80 0.70 0.50 1.00 0.80 0.60 0.90 0.85 0.85	
	0.85 0.85 0.50 0.70 0.40	
RW	(15)	RATIO OF THE SHIPPING WEIGHT TO THE UNPACKED WEIGHT OF THE KTH ITEM (RATIO)
	1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25	
	1.25 1.25 1.25 1.25 1.25	
STE	(5)	SUPPORT & TEST EQUIPMENT ACQUISITION COST ($/YEAR)
	500,000.00 0.00 0.00 0.00 0.00	
STEM	0.25	SUPPORT & TEST EQUIPMENT INITIAL SUPPORT RATE, PERCENT OF S&TE ACQUISITION COST (RATIO)
STES	5,000.00	SUPPORT & TEST EQUIPMENT RECURRING SUPPORT COST PER PRIMEEQUIPMENT ($/EQUIP.)
W	(15)	UNPACKED WEIGHT OF THE KTH ITEM (LB./ITEM)
	75.00 100.00 170.00 300.00 250.00 190.00 300.00 50.00 600.00 450.00	
	275.00 310.00 140.00 260.00 700.00	
Y	5	NUMBER OF YEARS COVERED BY THE LIFE CYCLE ANALYSIS (DIMENSIONLESS) Y

* READ ARRAY VALUES FROM LEFT TO RIGHT *

USER DEFINED SCALARS

SCALARS

NAME	DESCRIPTION	
DISP	DISPOSAL COST OF THE PRIME EQUIPMENT ($)	300,000.00
SALV	SALVATION COST OF THE PRIME EQUIPMENT ($)	-250,000.00

DATE 11/ 1/76

SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVMAT LCC MODEL

USER DEFINED ARRAYS

ARRAYS

NAME		DESCRIPTION				
DOC	(5)	PAYMENT BY GOVERNMENT TO OTHER CONTRACTORS FOR FULL SCALE DEVELOPMENT EFFORT DURING YEAR I ($/YR)				
	750,000.00	0.00	0.00	0.00	0.00	
DPC	(5)	PAYMENT BY GOVERNMENT TO PRIME CONTRACTOR FOR FULL SCALE DEVELOPMENT EFFORT DURING YEAR I ($/YR)				
	2,500,000.00	0.00	0.00	0.00	0.00	
ISP	(5)	ACQUISITION COST OF PRIME EQUIPMENT INITIAL SPARES ($/YR)				
	0.00	500,000.00	0.00	0.00	0.00	

* READ ARRAY VALUES FROM LEFT TO RIGHT *

COST ADJUSTMENT FACTORS

YEAR	INFLATION FACTORS				INFLATION AND DISCOUNT FACTORS				DISCOUNT FACTORS
	R & D	PROCUREMENT	CONSTRUCTION	O & M	R & D	PROCUREMENT	CONSTRUCTION	O & M	
FY77	1.027	1.035	1.030	1.025	0.980	0.984	0.982	0.977	0.955
FY78	1.084	1.107	1.092	1.076	0.939	0.959	0.946	0.933	0.868
FY79	1.144	1.185	1.157	1.130	0.901	0.933	0.912	0.890	0.789
FY80	1.207	1.268	1.227	1.187	0.864	0.908	0.879	0.850	0.717
FY81	1.273	1.357	1.300	1.246	0.829	0.883	0.847	0.811	0.652

********** MILITARY PERSONNEL FUNDING USES THE SAME COST ADJUSTMENT FACTORS AS O&M **********

SUMMARY

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ;CONSTANT DOLLARS*****

COST CATEGORY	COST ELEMENT: DEVELOPMENT	INVESTMENT	O&S	TERMINATION	COST CATEGORY TOTAL
CONTRACTOR	3,750,000	0	0	0	3,750,000
% OF COST CATEGORY TOTAL	100.0	0.0	0.0	0.0	100.0
% OF COST ELEMENT TOTAL	76.8	0.0	0.0	0.0	8.4
PROGRAM MANAGEMENT	800,000	920,000	0	0	1,720,000
% OF COST CATEGORY TOTAL	46.5	53.5	0.0	0.0	100.0
% OF COST ELEMENT TOTAL	16.4	10.2	0.0	0.0	3.8
TESTING	325,000	50,000	0	0	375,000
% OF COST CATEGORY TOTAL	86.7	13.3	0.0	0.0	100.0
% OF COST ELEMENT TOTAL	6.7	0.6	0.0	0.0	0.8
PRIME EQUIPMENT	0	5,560,000	0	0	5,560,000
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	61.6	0.0	0.0	12.4
TRAINING	10,000	200,000	143,900	0	353,900
% OF COST CATEGORY TOTAL	2.8	56.5	40.7	0.0	100.0
% OF COST ELEMENT TOTAL	0.2	2.2	0.5	0.0	0.8
SUPPLY SUPPORT	0	667,500	4,562,001	0	5,229,501
% OF COST CATEGORY TOTAL	0.0	12.8	87.2	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	7.4	14.8	0.0	11.7
TECHNICAL DATA	0	300,250	80,000	0	380,250
% OF COST CATEGORY TOTAL	0.0	79.0	21.0	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	3.3	0.3	0.0	0.8
SUPPORT EQUIPMENT	0	500,000	0	0	500,000
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	5.5	0.0	0.0	1.1
OPERATION	0	225,000	8,050,760	0	8,275,760
% OF COST CATEGORY TOTAL	0.0	2.7	97.3	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	2.5	26.1	0.0	18.5
MAINTENANCE	0	600,000	18,025,647	0	18,625,647
% OF COST CATEGORY TOTAL	0.0	3.2	96.8	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	6.6	58.4	0.0	41.6

SUMMARY

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ,CONSTANT DOLLARS*****

COST CATEGORY	COST ELEMENT: DEVELOPMENT	INVESTMENT	O&S	TERMINATION	COST CATEGORY TOTAL
TERMINATION	0	0	0	50,000	50,000
% OF COST CATEGORY TOTAL	0.0	0.0	0.0	100.0	100.0
% OF COST ELEMENT TOTAL	0.0	0.0	0.0	100.0	0.1
COST ELEMENT TOTAL	4,885,000	9,022,750	30,862,307	50,000	44,820,057
% OF LIFE CYCLE COST	10.9	20.1	68.9	0.1	100.0

FUNDING VS. COST CATEGORY

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ;CONSTANT DOLLARS*****

COST CATEGORY	FUNDING TYPE: R & D	PROCUREMENT	CONSTRUCTION	O & M	MIL. PERSONNEL	OTHERS	COST CATEGORY TOTAL
CONTRACTOR	3,750,000	0	0	0	0	0	3,750,000
% OF COST CATEGORY TOTAL	100.0	0.0	0.0	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	77.7	0.0	0.0	0.0	0.0	0.0	8.4
PROGRAM MANAGEMENT	800,000	920,000	0	0	0	0	1,720,000
% OF COST CATEGORY TOTAL	46.5	53.5	0.0	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	16.6	11.9	0.0	0.0	0.0	0.0	3.8
TESTING	275,000	50,000	50,000	0	0	0	375,000
% OF COST CATEGORY TOTAL	73.3	13.3	13.3	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	5.7	0.6	5.7	0.0	0.0	0.0	0.8
PRIME EQUIPMENT	0	5,560,000	0	0	0	0	5,560,000
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	71.7	0.0	0.0	0.0	0.0	12.4
TRAINING	0	50,000	0	13,900	290,000	0	353,900
% OF COST CATEGORY TOTAL	0.0	14.1	0.0	3.9	81.9	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	0.6	0.0	0.1	4.6	0.0	0.8
SUPPLY SUPPORT	0	625,000	0	4,604,501	0	0	5,229,501
% OF COST CATEGORY TOTAL	0.0	12.0	0.0	88.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	8.1	0.0	18.3	0.0	0.0	11.7
TECHNICAL DATA	0	300,250	0	80,000	0	0	380,250
% OF COST CATEGORY TOTAL	0.0	79.0	0.0	21.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	3.9	0.0	0.3	0.0	0.0	0.8
SUPPORT EQUIPMENT	0	500,000	0	0	0	0	500,000
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	6.4	0.0	0.0	0.0	0.0	1.1
OPERATION	0	0	225,000	4,525,000	3,525,760	0	8,275,760
% OF COST CATEGORY TOTAL	0.0	0.0	2.7	54.7	42.6	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	0.0	25.7	18.0	56.3	0.0	18.5
MAINTENANCE	0	0	600,000	15,582,564	2,443,083	0	18,625,647
% OF COST CATEGORY TOTAL	0.0	0.0	3.2	83.7	13.1	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	0.0	68.6	62.1	39.0	0.0	41.6

FUNDING VS. COST CATEGORY

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ,CONSTANT DOLLARS*****

COST CATEGORY	FUNDING TYPE						COST CATEGORY TOTAL
	R & D	PROCUREMENT	CONSTRUCTION	O & M	MIL. PERSONNEL	OTHERS	
TERMINATION	0	-250,000	0	300,000	0	0	50,000
% OF COST CATEGORY TOTAL	0.0	-500.0	0.0	600.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	-3.2	0.0	1.2	0.0	0.0	0.1
FUNDING TYPE TOTAL	4,825,000	7,755,250	875,000	25,105,964	6,258,843	0	44,820,057
% OF LIFE CYCLE COST	10.8	17.3	2.0	56.0	14.0	0.0	100.0

COST BREAKDOWN BY YEAR

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ;CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	COST FOR YEAR FY77	FY78	FY79	FY80	FY81
000000	TOTAL LIFE CYCLE	5,860,000	5,378,710	10,088,108	11,473,892	12,019,347
100000	RESEARCH AND DEVELOPMENT	4,885,000	0	0	0	0
110000	VALIDATION	750,000	0	0	0	0
111000	CONTRACTOR	500,000	0	0	0	0
112000	GOVERNMENT	250,000	0	0	0	0
120000	FULL SCALE DEVELOPMENT	4,135,000	0	0	0	0
121000	CONTRACTOR	3,250,000	0	0	0	0
121100	PRIME CONTRACTOR	2,500,000	0	0	0	0
121200	OTHER CONTRACTOR	750,000	0	0	0	0
122000	GOVERNMENT	885,000	0	0	0	0
122100	PROGRAM MANAGEMENT	550,000	0	0	0	0
122200	PROTOTYPE TEST & EVALUATION	335,000	0	0	0	0
122210	TRAINING	10,000	0	0	0	0
122220	TEST SITE ACTIVATION	50,000	0	0	0	0
122230	TEST & EVALUATION	275,000	0	0	0	0
200000	INVESTMENT	975,000	4,835,250	2,145,500	1,067,000	0
210000	GOVERNMENT PROGRAM MANAGEMENT	0	650,000	270,000	0	0
220000	PRIME EQUIPMENT ACQUISITION	0	3,005,000	1,563,000	1,042,000	0
221000	PRODUCTION HARDWARE	0	2,500,000	1,500,000	1,000,000	0
222000	PRODUCTION SUPPORT & SERVICES	0	350,000	0	0	0
223000	PRODUCTION TEST & EVALUATION	0	50,000	0	0	0
224000	TRANSPORTATION	0	30,000	18,000	12,000	0
225000	INSTALLATION & CHECKOUT	0	75,000	45,000	30,000	0
230000	INITIAL SUPPORT ACQUISITION	975,000	1,180,250	312,500	25,000	0
231000	SUPPORT & TEST EQUIPMENT ACQUISITION	500,000	0	0	0	0
232000	SUPPLY SUPPORT	125,000	542,500	0	0	0
232100	INITIAL SPARES	125,000	500,000	0	0	0
232110	PRIME EQUIPMENT	0	500,000	0	0	0
232120	SUPPORT & TEST EQUIPMENT	125,000	0	0	0	0
232200	NSN ENTRY INTO THE SUPPLY SYSTEM	0	42,500	0	0	0
233000	FACILITIES	0	550,000	275,000	0	0
233100	OPERATIONAL	0	150,000	75,000	0	0
233200	MAINTENANCE	0	400,000	200,000	0	0
234000	DOCUMENTATION	300,000	250	0	0	0
234100	ACQUISITION	300,000	0	0	0	0
234200	REPRODUCTION AND DISTRIBUTION	0	250	0	0	0
235000	TRAINING	50,000	87,500	37,500	25,000	0
235100	OPERATOR	0	25,000	15,000	10,000	0
235200	O/I LEVEL MAINTENANCE	0	37,500	22,500	15,000	0
235300	DEPOT LEVEL MAINTENANCE	0	10,000	0	0	0
235400	INSTRUCTOR	0	15,000	0	0	0
235500	TRAINING AIDS	50,000	0	0	0	0
300000	OPERATING AND SUPPORT	0	543,460	7,942,608	10,406,892	11,969,347

COST BREAKDOWN BY YEAR

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ,CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	COST FOR YEAR FY77	FY78	FY79	FY80	FY81
310000	OPERATION	0	0	2,302,360	2,874,200	2,874,200
311000	PERSONNEL	0	0	1,087,360	1,259,200	1,259,200
312000	FACILITIES	0	0	960,000	1,200,000	1,200,000
313000	ENERGY CONSUMPTION	0	0	256,000	320,000	320,000
314000	MATERIAL CONSUMPTION	0	0	64,000	80,000	80,000
315000	SOFTWARE MAINTENANCE	0	0	15,000	15,000	15,000
320000	SUPPORT	0	543,460	5,640,248	7,532,692	9,095,147
321000	CORRECTIVE MAINTENANCE	0	0	3,370,756	4,681,606	5,617,927
321100	LABOR	0	0	643,270	893,430	1,072,116
321110	O/I LEVEL (REMOVE & REPLACE)	0	0	197,465	274,257	329,108
321120	O/I LEVEL (REPAIR)	0	0	313,656	435,633	522,760
321130	DEPOT LEVEL (REPAIR)	0	0	132,149	183,540	220,248
321200	REPAIR MATERIAL	0	0	1,612,732	2,239,905	2,687,886
321300	TRANSPORTATION AND PACKAGING	0	0	1,114,755	1,548,271	1,857,925
321310	MATERIAL HANDLING LABOR	0	0	683,899	949,859	1,139,831
321320	PACKAGING MATERIAL	0	0	341,949	474,930	569,916
321330	SHIPPING	0	0	88,907	123,482	148,178
322000	PREVENTIVE MAINTENANCE	0	0	201,773	252,216	252,216
322100	LABOR	0	0	105,773	132,216	132,216
322200	MATERIAL	0	0	96,000	120,000	120,000
323000	OVERHAUL	0	0	0	0	325,312
323100	LABOR	0	0	0	0	165,312
323200	MATERIAL	0	0	0	0	120,000
323300	TRANSPORTATION	0	0	0	0	40,000
324000	SUPPORT & TEST EQUIPMENT MAINTENANCE	0	0	400,000	500,000	500,000
325000	FACILITIES	0	480,960	480,960	480,960	480,960
325100	SHOP SPACE	0	240,360	240,360	240,360	240,360
325110	O/I LEVEL	0	240,000	240,000	240,000	240,000
325120	DEPOT LEVEL	0	360	360	360	360
325200	INVENTORY STORAGE	0	240,600	240,600	240,600	240,600
325210	O/I LEVEL	0	240,000	240,000	240,000	240,000
325220	DEPOT LEVEL	0	600	600	600	600
326000	DOCUMENTATION MAINTENANCE	0	20,000	20,000	20,000	20,000
327000	SUPPLY SUPPORT	0	42,500	1,125,459	1,546,610	1,847,432
327100	REPLENISHMENT SPARES	0	0	1,082,959	1,504,110	1,804,932
327200	INVENTORY MANAGEMENT	0	42,500	42,500	42,500	42,500
328000	TRAINING	0	0	41,300	51,300	51,300
328100	OPERATOR	0	0	16,000	20,000	20,000
328200	O/I LEVEL MAINTENANCE	0	0	24,000	30,000	30,000
328300	DEPOT LEVEL MAINTENANCE	0	0	1,300	1,300	1,300
400000	TERMINATION	0	0	0	0	50,000
410000	SALVATION	0	0	0	0	-250,000
420000	DISPOSAL	0	0	0	0	300,000

COST BREAKDOWN TOTALS

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ,CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	TOTAL ADJUSTED COST	<----------PERCENTS OF TOTAL ADJUSTED COST FOR TOTAL LIFE CYCLE---------->				
000000	TOTAL LIFE CYCLE	44,820,057					100.0
100000	RESEARCH AND DEVELOPMENT	4,885,000					10.9
110000	VALIDATION	750,000				1.7	
111000	CONTRACTOR	500,000			1.1		
112000	GOVERNMENT	250,000			0.6		
120000	FULL SCALE DEVELOPMENT	4,135,000				9.2	
121000	CONTRACTOR	3,250,000			7.3		
121100	PRIME CONTRACTOR	2,500,000		5.6			
121200	OTHER CONTRACTOR	750,000		1.7			
122000	GOVERNMENT	885,000			2.0		
122100	PROGRAM MANAGEMENT	550,000		1.2			
122200	PROTOTYPE TEST & EVALUATION	335,000		0.7			
122210	TRAINING	10,000	0.0				
122220	TEST SITE ACTIVATION	50,000	0.1				
122230	TEST & EVALUATION	275,000	0.6				
200000	INVESTMENT	9,022,750					20.1
210000	GOVERNMENT PROGRAM MANAGEMENT	920,000				2.1	
220000	PRIME EQUIPMENT ACQUISITION	5,610,000				12.5	
221000	PRODUCTION HARDWARE	5,000,000			11.2		
222000	PRODUCTION SUPPORT & SERVICES	350,000			0.8		
223000	PRODUCTION TEST & EVALUATION	50,000			0.1		
224000	TRANSPORTATION	60,000			0.1		
225000	INSTALLATION & CHECKOUT	150,000			0.3		
230000	INITIAL SUPPORT ACQUISITION	2,492,750				5.6	
231000	SUPPORT & TEST EQUIPMENT ACQUISITION	500,000			1.1		
232000	SUPPLY SUPPORT	667,500			1.5		
232100	INITIAL SPARES	625,000		1.4			
232110	PRIME EQUIPMENT	500,000	1.1				
232120	SUPPORT & TEST EQUIPMENT	125,000	0.3				
232200	NSN ENTRY INTO THE SUPPLY SYSTEM	42,500		0.1			
233000	FACILITIES	825,000			1.8		
233100	OPERATIONAL	225,000		0.5			
233200	MAINTENANCE	600,000		1.3			
234000	DOCUMENTATION	300,250			0.7		
234100	ACQUISITION	300,000		0.7			
234200	REPRODUCTION AND DISTRIBUTION	250		0.0			
235000	TRAINING	200,000			0.4		
235100	OPERATOR	50,000		0.1			
235200	O/I LEVEL MAINTENANCE	75,000		0.2			
235300	DEPOT LEVEL MAINTENANCE	10,000		0.0			
235400	INSTRUCTOR	15,000		0.0			
235500	TRAINING AIDS	50,000		0.1			
300000	OPERATING AND SUPPORT	30,862,307					68.9

COST BREAKDOWN TOTALS

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ,CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	TOTAL ADJUSTED COST	<----PERCENTS OF TOTAL ADJUSTED COST FOR TOTAL LIFE CYCLE---->				
310000	OPERATION	8,050,760				18.0	
311000	PERSONNEL	3,525,760			7.9		
312000	FACILITIES	3,360,000			7.5		
313000	ENERGY CONSUMPTION	896,000			2.0		
314000	MATERIAL CONSUMPTION	224,000			0.5		
315000	SOFTWARE MAINTENANCE	45,000			0.1		
320000	SUPPORT	22,811,547				50.9	
321000	CORRECTIVE MAINTENANCE	13,670,290			30.5		
321100	LABOR	2,608,816		5.8			
321110	O/I LEVEL (REMOVE & REPLACE)	800,829	1.8				
321120	O/I LEVEL (REPAIR)	1,272,049	2.8				
321130	DEPOT LEVEL (REPAIR)	535,937	1.2				
321200	REPAIR MATERIAL	6,540,523		14.6			
321300	TRANSPORTATION AND PACKAGING	4,520,951		10.1			
321310	MATERIAL HANDLING LABOR	2,773,590	6.2				
321320	PACKAGING MATERIAL	1,386,795	3.1				
321330	SHIPPING	360,567	0.8				
322000	PREVENTIVE MAINTENANCE	706,205			1.6		
322100	LABOR	370,205		0.8			
322200	MATERIAL	336,000		0.7			
323000	OVERHAUL	325,312			0.7		
323100	LABOR	165,312		0.4			
323200	MATERIAL	120,000		0.3			
323300	TRANSPORTATION	40,000		0.1			
324000	SUPPORT & TEST EQUIPMENT MAINTENANCE	1,400,000			3.1		
325000	FACILITIES	1,923,840			4.3		
325100	SHOP SPACE	961,440		2.1			
325110	O/I LEVEL	960,000	2.1				
325120	DEPOT LEVEL	1,440	0.0				
325200	INVENTORY STORAGE	962,400		2.1			
325210	O/I LEVEL	960,000	2.1				
325220	DEPOT LEVEL	2,400	0.0				
326000	DOCUMENTATION MAINTENANCE	88,000			0.2		
327000	SUPPLY SUPPORT	4,562,001			10.2		
327100	REPLENISHMENT SPARES	4,392,001		9.8			
327200	INVENTORY MANAGEMENT	170,000		0.4			
328000	TRAINING	143,900			0.3		
328100	OPERATOR	56,000		0.1			
328200	O/I LEVEL MAINTENANCE	84,000		0.2			
328300	DEPOT LEVEL MAINTENANCE	1,900		0.0			
400000	TERMINATION	50,000					0.1
410000	SALVATION	-250,000				-0.6	
420000	DISPOSAL	300,000				0.7	

GENERAL FUNDING REPORT

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ;CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	<- GENERAL TYPE OF FUNDING -> R & D	PROCUREMENT	CONSTRUCTION	O & M	MIL. PERSONNEL	OTHERS	TOTAL
000000	TOTAL LIFE CYCLE	4,825,000	7,755,250	875,000	25,185,964	6,258,843		44,820,057
100000	RESEARCH AND DEVELOPMENT	4,825,000	0	50,000	0	10,000	0	4,885,000
110000	VALIDATION	750,000	0	0	0	0	0	750,000
111000	CONTRACTOR	500,000	0	0	0	0	0	500,000
112000	GOVERNMENT	250,000	0	0	0	0	0	250,000
120000	FULL SCALE DEVELOPMENT	4,075,000	0	50,000	0	10,000	0	4,135,000
121000	CONTRACTOR	3,250,000	0	0	0	0	0	3,250,000
121100	PRIME CONTRACTOR	2,500,000	0	0	0	0	0	2,500,000
121200	OTHER CONTRACTOR	750,000	0	0	0	0	0	750,000
122000	GOVERNMENT	825,000	0	50,000	0	10,000	0	885,000
122100	PROGRAM MANAGEMENT	550,000	0	0	0	0	0	550,000
122200	PROTOTYPE TEST & EVALUATION	275,000	0	50,000	0	10,000	0	335,000
122210	TRAINING	0	0	0	0	10,000	0	10,000
122220	TEST SITE ACTIVATION	0	0	50,000	0	0	0	50,000
122230	TEST & EVALUATION	275,000	0	0	0	0	0	275,000
200000	INVESTMENT	0	8,005,250	825,000	52,500	140,000	0	9,022,750
210000	GOVERNMENT PROGRAM MANAGEMENT	0	920,000	0	0	0	0	920,000
220000	PRIME EQUIPMENT ACQUISITION	0	5,610,000	0	0	0	0	5,610,000
221000	PRODUCTION HARDWARE	0	5,000,000	0	0	0	0	5,000,000
222000	PRODUCTION SUPPORT & SERVICES	0	350,000	0	0	0	0	350,000
223000	PRODUCTION TEST & EVALUATION	0	50,000	0	0	0	0	50,000
224000	TRANSPORTATION	0	60,000	0	0	0	0	60,000
225000	INSTALLATION & CHECKOUT	0	150,000	0	0	0	0	150,000
230000	INITIAL SUPPORT ACQUISITION	0	1,475,250	825,000	52,500	140,000	0	2,492,750
231000	SUPPORT & TEST EQUIPMENT ACQUISITION	0	500,000	0	0	0	0	500,000
232000	SUPPLY SUPPORT	0	625,000	0	42,500	0	0	667,500
232100	INITIAL SPARES	0	625,000	0	0	0	0	625,000
232110	PRIME EQUIPMENT	0	500,000	0	0	0	0	500,000
232120	SUPPORT & TEST EQUIPMENT	0	125,000	0	0	0	0	125,000
232200	NSN ENTRY INTO THE SUPPLY SYSTEM	0	0	0	42,500	0	0	42,500
233000	FACILITIES	0	0	825,000	0	0	0	825,000
233100	OPERATIONAL	0	0	225,000	0	0	0	225,000
233200	MAINTENANCE	0	0	600,000	0	0	0	600,000
234000	DOCUMENTATION	0	300,250	0	0	0	0	300,250
234100	ACQUISITION	0	300,000	0	0	0	0	300,000
234200	REPRODUCTION AND DISTRIBUTION	0	250	0	0	0	0	250
[illegible]	TRAINING	0	50,000	0	10,000	140,000	0	200,000
235100	OPERATOR	0	0	0	0	80,000	0	80,000
235200	O/I LEVEL MAINTENANCE	0	0	0	0	75,000	0	75,000
235300	DEPOT LEVEL MAINTENANCE	0	0	0	10,000	0	0	10,000
235400	INSTRUCTOR	0	0	0	0	15,000	0	15,000
235500	TRAINING AIDS	0	50,000	0	0	0	0	50,000
300000	OPERATING AND SUPPORT	0	0	0	24,753,464	6,108,843	0	30,862,307

GENERAL FUNDING REPORT

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ,CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	<- - - - - - - - - GENERAL TYPE OF FUNDING - - - - - - - - -> R & D	PROCUREMENT	CONSTRUCTION	O & M	MIL. PERSONNEL	OTHERS	TOTAL
310000	OPERATION	0	0	0	4,525,000	3,525,760	0	8,050,760
311000	PERSONNEL	0	0	0	0	3,525,760	0	3,525,760
312000	FACILITIES	0	0	0	3,360,000	0	0	3,360,000
313000	ENERGY CONSUMPTION	0	0	0	896,000	0	0	896,000
314000	MATERIAL CONSUMPTION	0	0	0	224,000	0	0	224,000
315000	SOFTWARE MAINTENANCE	0	0	0	45,000	0	0	45,000
320000	SUPPORT	0	0	0	20,220,464	2,583,083	0	22,811,547
321000	CORRECTIVE MAINTENANCE	0	0	0	11,597,412	2,072,870	0	13,670,290
321100	LABOR	0	0	0	535,937	2,072,870	0	2,608,816
321110	O/I LEVEL (REMOVE & REPLACE)	0	0	0	0	800,829	0	800,829
321120	O/I LEVEL (REPAIR)	0	0	0	0	1,272,049	0	1,272,049
321130	DEPOT LEVEL (REPAIR)	0	0	0	535,937	0	0	535,937
321200	REPAIR MATERIAL	0	0	0	6,540,523	0	0	6,540,523
321300	TRANSPORTATION AND PACKAGING	0	0	0	4,520,951	0	0	4,520,951
321310	MATERIAL HANDLING LABOR	0	0	0	2,773,590	0	0	2,773,590
321320	PACKAGING MATERIAL	0	0	0	1,386,795	0	0	1,386,795
321330	SHIPPING	0	0	0	360,567	0	0	360,567
322000	PREVENTIVE MAINTENANCE	0	0	0	336,000	370,205	0	706,205
322100	LABOR	0	0	0	0	370,205	0	370,205
322200	MATERIAL	0	0	0	336,000	0	0	336,000
323000	OVERHAUL	0	0	0	325,312	0	0	325,312
323100	LABOR	0	0	0	165,312	0	0	165,312
323200	MATERIAL	0	0	0	120,000	0	0	120,000
323300	TRANSPORTATION	0	0	0	40,000	0	0	40,000
324000	SUPPORT & TEST EQUIPMENT MAINTENANCE	0	0	0	1,400,000	0	0	1,400,000
325000	FACILITIES	0	0	0	1,923,840	0	0	1,923,840
325100	SHOP SPACE	0	0	0	961,440	0	0	961,440
325110	O/I LEVEL	0	0	0	960,000	0	0	960,000
325120	DEPOT LEVEL	0	0	0	1,440	0	0	1,440
325200	INVENTORY STORAGE	0	0	0	962,400	0	0	962,400
325210	O/I LEVEL	0	0	0	960,000	0	0	960,000
325220	DEPOT LEVEL	0	0	0	2,400	0	0	2,400
326000	DOCUMENTATION MAINTENANCE	0	0	0	80,000	0	0	80,000
327000	SUPPLY SUPPORT	0	0	0	4,562,001	0	0	4,562,001
327100	REPLENISHMENT SPARES	0	0	0	4,392,001	0	0	4,392,001
327200	INVENTORY MANAGEMENT	0	0	0	170,000	0	0	170,000
328000	TRAINING	0	0	0	3,900	140,000	0	143,900
328100	OPERATOR	0	0	0	0	56,000	0	56,000
328200	O/I LEVEL MAINTENANCE	0	0	0	0	84,000	0	84,000
328300	DEPOT LEVEL MAINTENANCE	0	0	0	3,900	0	0	3,900
400000	TERMINATION	0	-250,000	0	300,000	0	0	50,000
410000	SALVATION	0	-250,000	0	0	0	0	-250,000
420000	DISPOSAL	0	0	0	300,000	0	0	300,000

$$$ COSTS IN DOLLARS $$$

ANNUAL COST BY FUNDING TYPE

*****BASE YEAR=FY77 ,CONSTANT DOLLARS*****

YEAR	FUNDING TYPE						
	R & D	PROCUREMENT	CONSTRUCTION	O & M	MIL. PERSONNEL	OTHERS	TOTAL
FY77	4,825,000	975,000	50,000	0	10,000	0	5,860,000
FY78	0	4,155,250	550,000	505,960	77,500	0	5,378,710
FY79	0	1,833,000	275,000	6,278,355	1,701,754	0	10,088,108
FY80	0	1,042,000	0	8,255,586	2,176,306	0	11,473,892
FY81	0	-250,000	0	9,976,063	2,293,284	0	12,019,347
TOTAL	4,825,000	7,755,250	875,000	25,105,964	6,258,843	0	44,820,057

ANNUAL COST BY COST CATEGORY

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ,CONSTANT DOLLARS*****

< - - - - - - - - - - COST CATEGORY - - - - - - - - - - >

YEAR	CONTRACTOR	PROGRAM MANAGEMENT	TESTING	PRIME EQUIPMENT	TRAINING	SUPPLY SUPPORT	TECHNICAL DATA	SUPPORT EQUIPMENT	OPERATION	MAIN-TENANCE
FY77	3,750,000	800,000	325,000	0	60,000	125,000	300,000	500,000	0	0
FY78	0	650,000	50,000	2,955,000	87,500	585,000	20,250	0	150,000	880,960
FY79	0	270,000	0	1,563,000	78,800	1,125,459	20,000	0	2,377,360	4,653,489
FY80	0	0	0	1,042,000	76,300	1,546,610	20,000	0	2,874,200	5,914,782
FY81	0	0	0	0	51,300	1,847,432	20,000	0	2,874,200	7,176,415
TOTAL	3,750,000	1,720,000	375,000	5,560,000	353,900	5,229,501	380,250	500,000	8,275,760	18,625,647

DATE 11/ 1/76 SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVMAT LCC MODEL PAGE 13,002

$$$ COSTS IN DOLLARS $$$ ANNUAL COST BY COST CATEGORY

*****BASE YEAR=FY77 ;CONSTANT DOLLARS*****

YEAR	TERMINATIO	TOTAL
FY77	0	5,868,888
FY78	0	5,378,710
FY79	0	10,888,108
FY88	0	11,473,892
FY81	50,000	12,019,347
TOTAL	50,000	44,828,057

SENSITIVITY ANALYSIS

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ;CONSTANT DOLLARS*****

SENSITIZED VARIABLE:
CU UNIT PRICE OF ONE OF THE CONTRACTORS EQUIPMENT ($/EQUIPMENT)

SEN. NUM.	VALUE	COST ELEMENT: DEVELOPMENT $	%	INVESTMENT $	%	O&S $	%	TERMINATION $	%	TOTAL LIFE CYCLE $	%
0	50,000,00	4,885,000	0.0	9,022,750	0.0	30,862,307	0.0	50,000	0.0	44,820,057	0.0
1	25,000,00	4,885,000	0.0	6,522,750	-27.7	30,862,307	0.0	50,000	0.0	42,320,057	-5.6
2	30,000,00	4,885,000	0.0	7,022,750	-22.2	30,862,307	0.0	50,000	0.0	42,820,057	-4.5
3	35,000,00	4,885,000	0.0	7,522,750	-16.6	30,862,307	0.0	50,000	0.0	43,320,057	-3.3
4	40,000,00	4,885,000	0.0	8,022,750	-11.1	30,862,307	0.0	50,000	0.0	43,820,057	-2.2
5	45,000,00	4,885,000	0.0	8,522,750	-5.5	30,862,307	0.0	50,000	0.0	44,320,057	-1.1
6	50,000,00	4,885,000	0.0	9,022,750	0.0	30,862,307	0.0	50,000	0.0	44,820,057	0.0
7	55,000,00	4,885,000	0.0	9,522,750	5.5	30,862,307	0.0	50,000	0.0	45,320,057	1.1
8	60,000,00	4,885,000	0.0	10,022,750	11.1	30,862,307	0.0	50,000	0.0	45,820,057	2.2
9	65,000,00	4,885,000	0.0	10,522,750	16.6	30,862,307	0.0	50,000	0.0	46,320,057	3.3
10	70,000,00	4,885,000	0.0	11,022,750	22.2	30,862,307	0.0	50,000	0.0	46,820,057	4.5
11	75,000,00	4,885,000	0.0	11,522,750	27.7	30,862,307	0.0	50,000	0.0	47,320,057	5.6

SEN. NUM. 0 DENOTES BASE VALUES
% - PERCENT CHANGE FROM BASE VALUE

SENSITIVITY ANALYSIS

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ;CONSTANT DOLLARS*****

SENSITIZED VARIABLE:
R MEAN TIME BETWEEN FAILURES OF THE SPARE/REPAIR ITEM (HR/ITEM)

SEN. NUM.	VALUE	COST ELEMENT: DEVELOPMENT $	%	INVESTMENT $	%	O&S $	%	TERMINATION $	%	TOTAL LIFE CYCLE $	%
0	1.00	4,885,000	0.0	9,022,750	0.0	30,862,307	0.0	50,000	0.0	44,820,057	0.0
1	0.50	4,885,000	0.0	9,022,750	0.0	48,924,598	58.5	50,000	0.0	62,882,348	40.3
2	0.60	4,885,000	0.0	9,022,750	0.0	42,903,835	39.0	50,000	0.0	56,861,585	26.9
3	0.70	4,885,000	0.0	9,022,750	0.0	38,603,289	25.1	50,000	0.0	52,561,039	17.3
4	0.80	4,885,000	0.0	9,022,750	0.0	35,377,880	14.6	50,000	0.0	49,335,630	10.1
5	0.90	4,885,000	0.0	9,022,750	0.0	32,869,229	6.5	50,000	0.0	46,826,979	4.5
6	1.00	4,885,000	0.0	9,022,750	0.0	30,862,307	0.0	50,000	0.0	44,820,057	0.0
7	1.10	4,885,000	0.0	9,022,750	0.0	29,220,281	-5.3	50,000	0.0	43,178,031	-3.7
8	1.20	4,885,000	0.0	9,022,750	0.0	27,851,926	-9.8	50,000	0.0	41,809,676	-6.7
9	1.30	4,885,000	0.0	9,022,750	0.0	26,694,087	-13.5	50,000	0.0	40,651,837	-9.3
10	1.40	4,885,000	0.0	9,022,750	0.0	25,701,653	-16.7	50,000	0.0	39,659,403	-11.5
11	1.50	4,885,000	0.0	9,022,750	0.0	24,841,544	-19.5	50,000	0.0	38,799,294	-13.4

SEN. NUM. 0 DENOTES BASE VALUES
% - PERCENT CHANGE FROM BASE VALUE

SENSITIVITY ANALYSIS

$$$ COSTS IN DOLLARS $$$ *****BASE YEAR=FY77 ,CONSTANT DOLLARS*****

MATRIX OF VALUES FOR THE SENSITIVITY ANALYSIS OF VARIABLE R

SEN. NUM.	0	1	2	3	4	5	6	7	8	9	10	11
MULTIPLIER	1.00	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50
ARRAY INDEX												
1	750.00	375.00	450.00	525.00	600.00	675.00	750.00	825.00	900.00	975.00	1050.00	1125.00
2	500.00	250.00	300.00	350.00	400.00	450.00	500.00	550.00	600.00	650.00	700.00	750.00
3	870.00	435.00	522.00	609.00	696.00	783.00	870.00	957.00	1044.00	1131.00	1218.00	1305.00
4	600.00	300.00	360.00	420.00	480.00	540.00	600.00	660.00	720.00	780.00	840.00	900.00
5	250.00	125.00	150.00	175.00	200.00	225.00	250.00	275.00	300.00	325.00	350.00	375.00
6	400.00	200.00	240.00	280.00	320.00	360.00	400.00	440.00	480.00	520.00	560.00	600.00
7	600.00	300.00	360.00	420.00	480.00	540.00	600.00	660.00	720.00	780.00	840.00	900.00
8	900.00	450.00	540.00	630.00	720.00	810.00	900.00	990.00	1080.00	1170.00	1260.00	1350.00
9	350.00	175.00	210.00	245.00	280.00	315.00	350.00	385.00	420.00	455.00	490.00	525.00
10	350.00	175.00	210.00	245.00	280.00	315.00	350.00	385.00	420.00	455.00	490.00	525.00
11	350.00	175.00	210.00	245.00	280.00	315.00	350.00	385.00	420.00	455.00	490.00	525.00
12	350.00	175.00	210.00	245.00	280.00	315.00	350.00	385.00	420.00	455.00	490.00	525.00
13	700.00	350.00	420.00	490.00	560.00	630.00	700.00	770.00	840.00	910.00	980.00	1050.00
14	1200.00	600.00	720.00	840.00	960.00	1080.00	1200.00	1320.00	1440.00	1560.00	1680.00	1800.00
15	1500.00	750.00	900.00	1050.00	1200.00	1350.00	1500.00	1650.00	1800.00	1950.00	2100.00	2250.00

SEN. NUM. 0 DENOTES BASE VALUES
% - PERCENT CHANGE FROM BASE VALUE